

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

Guidance Document

Developed by

The Upper John Day River  
Local Advisory Committee

With assistance from

Oregon Department of Agriculture  
and  
Grant Soil and Water Conservation District

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## Acronyms

Area Plan	Agricultural Water Quality Management Area Plan
AUM	Animal Unit Months
BLM	Bureau of Land Management
BOA	Board of Agriculture
CREP	Conservation Reserve Enhancement Program
CTWSR	Confederated Tribes of Warm Springs Reservation of Oregon
Department	Oregon Department of Agriculture
DEQ	Department of Environmental Quality
District	Grant Soil and Water Conservation District
DMA	Designated Management Area
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
FOTG	Field Office Technical Guide
FPA	Forest Practices Act
GPM	Gallons Per Minute
LAC	Local Advisory Committee
LMA	Local Management Agency
MBF	Million Board Feet
NRCS	Natural Resources Conservation Service
OACD	Oregon Association of Conservation Districts
OAR	Oregon Administrative Rules
OCA	Oregon Cattlemen's Association
ODFW	Oregon Department of Fish and Wildlife
OSU Extension	Oregon State University Extension
OWEB	Oregon Watershed Enhancement Board
RM	River Miles
RUSLE	Revised Universal Soil Loss Equation
TMDL	Total Maximum Daily Load
USDA	U S Department of Agriculture
USFS	US Forest Service
WRD	Water Resources Department



# **Agricultural Water Quality Management Area Plan**

## **Upper Mainstem and South Fork John Day River**

### **FOREWORD**

This Agricultural Water Quality Management Area Plan (Area Plan) provides guidance for addressing agricultural water quality issues in the Upper Mainstem and South Fork Subbasins of the John Day River Agricultural Water Quality Management Area. The purpose of this Plan is to identify strategies to reduce water pollution from agricultural lands through a combination of educational programs, suggested land treatments, management activities, and monitoring. The provisions of this Plan do not establish legal requirements or prohibitions. This Area Plan will be used by local management agencies for guiding their implementation, outreach, and assistance efforts to landowners and by landowners to enhance their awareness and understanding of water quality issues.

The Oregon Department of Agriculture (Department) will exercise its enforcement authority for the prevention and control of water pollution from agricultural activities under Area Rules for the Upper Mainstem and South Fork Subbasins of the John Day River (Oregon Administrative Rules [OAR] 603-095-2000 through 603-095-2040) and state-wide enforcement procedures provided in OAR 603-090-0060 through 603-090-0120.

This is a local Area Plan created by the Upper Mainstem and South Fork John Day River Agricultural Water Quality Local Advisory Committee (Committee), the Department, and the Grant Soil and Water Conservation District (District).

The Area Rules, to implement the Area Plan, were formally adopted by the Department in December 2002. The Area Plan was revised in 2011 to update the reference information, water quality standards and include Total Maximum Daily Load (TMDL) target information. The 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 Upper John Day Subbasin, 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 Committee, Department, and District 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 Department, Committee, and District 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 Area.

# INTRODUCTION

In 1972, the United States Congress passed, and President Nixon signed, the Clean Water Act into law. Controlling and preventing pollution from point sources was the initial focus in the first years of implementing the Clean Water Act.

The Agricultural Water Quality Management Act, was passed in 1993 to formally organize agricultural efforts to address water pollution from agricultural activities and soil erosion. The Department is authorized to develop and carry out a water quality management plan for any agricultural or rural lands, where such a plan is required by state or federal law. The Department must base the plan and rules adopted to implement the plan upon scientific information.

There is a great deal of information in the scientific literature and natural resources management agency documents that describes the transport and fate of pollutants in an agricultural setting and the effectiveness of various land management practices that can be employed to limit the movement of potential pollutants into waterways.

The Department has developed a review of the literature that establishes the scientific basis for water quality protection based on landscape conditions. A reference to this document, *Relationship Between Agriculture Water Quality Management Area Plan Conditions and Water Quality Standards*, is listed in Attachment B. The document is available for review at the District office.

The Department is the designated management agency (DMA) for water pollution control activities on agricultural and rural lands. The Department is one of many DMAs designated by applicable jurisdiction (e.g. U.S. Forest Service is the DMA for water pollution control activities on Federal Forest Lands located within the plan area) for implementation of the TMDLs. The District is the local management agency (LMA) designated by the Department for development and implementation of the Area Plan. Implementation priorities will be established on a periodic basis through annual work plans developed jointly by the Districts and the Department with input from other partners.

Designated management agencies with jurisdiction and responsibilities in other geographic areas of the management area may adopt by reference, the provisions outlined in this plan and the requirements indicated in the associated OARs. The Department and the District will work with designated management agencies that have lands in agricultural use in their jurisdictions to assure that provisions of this Plan apply and to prevent the duplication of any services and fees assessed.

The State Board of Agriculture appointed a Local Advisory Committee representing local agricultural producers, landowners, agencies, tribes, environmental organizations and the District, for the purpose of assisting with the development of this Plan and the associated OARs to implement core elements of the Plan. In accordance with OAR 603-090-0020, the Committee consists primarily of “landowners in the effected local agricultural water quality management area.” Representatives of the environmental, recreational and business community are also part of the Committee. They volunteered and were selected to represent the diverse aspects of the communities comprising the Upper Mainstem and South Fork John Day River subbasins. In

drafting the following plan, the Committee has made every attempt to follow and conform to the Agricultural Water Quality Management Act and the Area Rules for implementing the law.

This Plan encompasses all agricultural lands within the Upper John Day River subbasin and the South Fork subbasin upstream from Picture Gorge. The three other subbasins (Lower John Day, Middle John Day, North and Middle Forks John Day) are being addressed by their respective local advisory committees. Provisions of this Plan apply to all agricultural lands and to all agricultural uses. “Agricultural use” is defined in OAR 603-095-0010(4). Activities subject to the Oregon Forest Practices Act are exempt from the provisions of this Plan. Federal land managers are responsible for water quality on the lands they manage in this management area.

This agricultural water quality management plan addresses the following conditions as they relate to water quality issues on lands in agricultural use:

- Waste management
- Livestock management
- Uplands management
- Streamside management
- Irrigation management

Area Rules were formally adopted as part of OAR to implement this Area Plan. Area Rules define the planning area, provide prevention and control measures to protect water quality, provide exceptions to the prevention and control measures and describe a complaint resolution process. *Area Rules are presented in this Area Plan and indicated by bold type within a border.*

#### **OAR 603-095-2000**

##### **Purpose**

**(1) These rules have been developed to implement a water quality management area plan for the Upper Mainstem and South Fork John Day River Agricultural Water Quality Management Area pursuant to authorities vested in the department through ORS 568.900 – ORS 568.933 and ORS 561.190 – ORS 561.191. The area plan is known as the Upper Mainstem and South Fork John Day Agricultural Water Quality Management Area Plan.**

**(2) The purpose of these rules is to outline requirements for landowners in the Upper Mainstem and South Fork John Day River Agricultural Water Quality Management Area to prevent and control water pollution from agricultural activities and soil erosion. Compliance with Division 95 rules is expected to aid in the achievement of applicable water quality standards in the Upper Mainstem and South Fork John Day River Water Quality Management Area.**

# GEOGRAPHIC AREA AND PHYSICAL SETTING

The area included in this planning effort encompasses the Upper Mainstem and South Fork John Day River subbasins. 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 area from Dayville to the headwaters. The John Day River drains 8,100 square miles of land in east central Oregon and is the third largest drainage in the state.

## **OAR 603-095-2020**

### **Geographic and Programmatic Scope**

- (1) The Upper Mainstem and South Fork John Day River Management Area includes the area that drains into the John Day River upstream of Picture Gorge. The physical boundaries of the Management Area are indicated on the map included as Attachment 1 of these rules.**
- (2) Operational boundaries for the land base under the purview of these rules include all lands within the Management Area in agricultural use, agricultural and rural lands that are lying idle or on which management has been deferred, and forested lands with agricultural activities, with the exception of public lands managed by federal agencies.**
- (3) Current productive agricultural use is not required for the provisions of these rules to apply.**
- (4) The provisions and requirements outlined in these rules may be adopted by reference by Designated Management Agencies with appropriate authority and responsibilities in the Upper Mainstem and South Fork John Day River Management Area.**
- (5) For lands in agricultural use within other Designated Management Agencies' or state agency jurisdictions, the department and the appropriate Local Management Agency shall work with these Designated Management Agencies to assure that provisions of these rules apply, and to assure that duplication of any services provided does not occur.**

## **Past Human Activities within the Plan 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. Animal Unit Months (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

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

(2) *OSU Extension Reports*

### **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)

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

(2) Oregon State College Extension Service Annual Report From December 1, 1947 to Nov. 30, 1948

(3) Oregon State College Extension Service Annual Report From December 1, 1947 to Nov. 30, 1948

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

### **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.

### **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. 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).

## **Mining**

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 know as the Humbolt Diggings. Significant miles of ditches were hand dug subsequent to the strikes of 1862 to provide water to support mining operations.

## **Naturally Occurring Thermal Sources**

The Upper Mainstem contains a number of geothermal energy sources. Most significantly: Mount Vernon Hot Springs (120.2°F); Limekiln Hot Springs (69.8°F); Blue Mountain Hot Springs (136.4°F); Joaquin Miller Hot Spring (118.4°F) and Thompson Hot Springs (88°F) on Indian Creek.

## **Logging Practices**

It was common practice until the 1980's, 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 was estimated to have caused \$7,000,000 in 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.

## **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 Basin is in the Upper Mainstem 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 2010 U.S. Census indicates that the current Grant County population of 7,445 individuals has receded by approximately 6 percent from its 2000 population of 7,935. The subbasin also is the location of much of the John Day Basin's industry.

The Upper Mainstem is within the ceded lands of the Confederated Tribes of the Warm Springs Reservation of Oregon (Warm Springs Tribes). By treaty, the 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 land and its resources. This area was, and is currently, used by the 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 Tribes furthering their interest in resource management in this subbasin. The Warm Springs Tribes has acquired title to several tracts of land that will be managed for fish and wildlife purposes, as well as being used for agriculture for traditional uses. Also, the Tribes and the Oregon Department of Fish and Wildlife (ODFW) have comanagement responsibility and authority for the fish and wildlife program in the basin.

Local economic activity is strongly influenced by federal land management use decisions since most of Grant County's land base (60 percent) is publicly owned. The Forest Service 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 containing grass and alfalfa for hay. Logging is critically important to the local economy. In 1991, approximately 209 million board feet (MBF) were sold off the Malheur National Forest compared with approximately 13.5 MBF sold in 2000. In 1996, approximately 46,765 acres burned on the Malheur National Forest. 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. Attachment A contains further information.

## **South Fork 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 Confederated Tribes of the Umatilla Indian Reservation and 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. Attachment A contains further information.

# **WATER QUALITY ISSUES**

The federal Clean Water Act requires that each state designate beneficial uses, decide which parameters to measure to determine whether beneficial uses are being met, and to set criteria for those parameters. Sections 303(d) of the Clean Water Act directs each state, through the Oregon Department of Environmental Quality (DEQ), to develop a list of water quality limited streams that violate water quality standards and do not support all of the beneficial uses. The Clean Water Act also directs states to develop Total Maximum Daily Loads (TMDL) for 303(d) listed streams. The TMDL results in allocations of pollutant loads to different sources such as agriculture, urban areas, and federal lands. Each jurisdictional authority then develops water quality management plans to achieve the load allocations. The John Day 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.

A TMDL assessment uses scientific data collection and analysis to determine the amount and source of each pollutant entering streams. A TMDL is the maximum amount of pollutant that can be present in a waterbody while meeting water quality standards. These maximum allowable pollutant loads are assigned to contributing sources, typically to land use authorities.

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.

## **Beneficial Uses of Water For Plan Area**

According to OAR 340-41-602, water in the John Day Basin is to be managed to protect the recognized beneficial uses. Those beneficial uses are: domestic and industrial water supplies, irrigation, livestock watering, anadromous fish passage, salmonid fish rearing and spawning, resident fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation and aesthetic quality.

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

## **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**

Water temperature is the most widespread concern in the basin. The causes of stream heating are excess solar radiation, decreased groundwater interaction and instream flow reduction. These can result *from natural disturbances* and human-related stream modifications such as vegetation disturbance, irrigation withdrawal and channel straightening. 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.

*Where DEQ determines that the natural thermal potential of all or a portion of a water body exceeds the biologically-based temperature standards, the natural thermal potential temperatures supersede the existing biologically-based criteria, and are deemed to be the applicable temperature criteria for that water body (OAR 340-041-0028(8)).*

DEQ computer simulation of heating along the Upper John Day River indicates that the biological-based criteria are not attainable in much of the subbasin. In such situations, the temperature standard specifies that the target of the TMDL is natural thermal potential temperatures. The TMDL defines natural thermal potential as the best estimate of vegetation, channel shape, stream flow and other thermal controls that would occur without past and present human disturbance.

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*, pose a threat to the health of water contact recreation users and domestic water supplies. Potential sources of bacteria include animal manure and septic systems.

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

As an alternative to estimating the load allocation directly, the bacteria TMDL establishes a surrogate measure expressed in a phased bacteria level reduction until the numeric standard above is achieved. An interim percent load reduction of 69% 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% 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. Animal manure 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 refers 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.

## **Sources of Water Quality Impairment**

Both point and nonpoint sources contribute to water pollution. Point sources are those types of pollution that come from one definable, easily recognizable and easily measurable spot. Water coming from a city's wastewater treatment plant outlet into a stream is one example of point source pollution. Nonpoint source pollutants are substances of widespread origin that runoff, washoff, or seep through the ground, eventually entering surface waters or groundwater. Because nonpoint source pollution results from diffuse sources rather than from discharge at a specific location, the greatest loads of nonpoint source pollution are very difficult to identify. Agricultural operations, with few exceptions, are concerned with preventing or controlling pollution from nonpoint sources.

Probable sources of pollution in a watershed include: eroding agricultural, rural and forestlands, eroding streambanks, runoff and erosion from roads and urban areas, 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.

## **Total Maximum Daily Loads**

The Federal Clean Water Act (CWA) requires DEQ to develop pollution control targets and improvement plans for waterbodies found to be in violation of water quality standards. The targets, or “Total Maximum Daily Loads” (TMDLs), establish the maximum amount of a pollutant that can be present in a waterbody while still meeting water quality standards. These maximum allowable pollutant loads are then assigned to contributing point and nonpoint sources of pollution. Point sources are those associated with distinct human-made conveyances such as pipes from wastewater treatment plants. Wasteload allocations are the portion of TMDLs attributed to these point sources. Nonpoint pollutant sources are wide spread sources such as field runoff or excess solar radiation. Load allocations are the portions of TMDLs attributed to nonpoint sources, either natural or human.

Additional conditions of the CWA also require DEQ to lay out strategies and approaches for implementing the TMDL allocations in an associated Water Quality Management Plan (WQMP). The WQMP identifies specific land use or management sectors responsible for TMDL planning and implementation. These sector specific plans, including this document, comprise a second tier of planning prepared by land use or water quality authorities. These authorities or Designated Management Agencies (DMA) are defined in the “TMDL Rule” (OAR 340-042-0030(2)) as “a federal, state, or local governmental agency that has legal authority over a sector or source of contributing pollutants, and is identified as such by DEQ in a TMDL.” DEQ has requested the appropriate DMAs in the subbasin to develop pollution control plans and programs designed to achieve the load allocations for the area each administers. OAR 340-042-0080 provides authority to ODA for implementing plans to achieve designated TMDL targets for agricultural activities.

The John Day River Basin Total Maximum Daily Load and Water Quality Management Plan can be viewed on the DEQ Website at:  
<http://www.deq.state.or.us/WQ/TMDLs/docs/johndaybasin/TMDLandWQMPPFINAL.pdf>.

# **VISION, MISSION, GOALS AND OBJECTIVES**

## **Vision**

Maintain and/or improve the water quality of the streams located in the Upper Mainstem and South Fork John Day River Agricultural Water Quality 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 Agricultural Water Quality Management Area.

## **Goals**

- Prevent and control water pollution from agricultural and rural land activities and soil erosion to achieve applicable water quality standards
- To respect private property rights

## **Objectives**

- 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



# STRATEGIES FOR ACHIEVING PLAN PURPOSE, GOALS, AND OBJECTIVES

The Department and the District's 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.

## Prevention and Control 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.

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.**

## Waste 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.

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

### ORS 468B.025 Prohibited Activities

- (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.
- (3) Violation of subsection (1) or (2) of this section is a public nuisance.

### Definitions (ORS 468B.005)

“Wastes”, means sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances which will or may cause pollution or tends to cause pollution of any waters of the state. Additionally, OAR 603-95-0010(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 of the state, which will or tends to, either by itself or in connection with any other substance, create a public nuisance or which will or tends to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof.

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

## Livestock Management

Landowners or operators shall manage their ranch 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.

**(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.

## Uplands Management

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

This Area Plan does not prescribe specific practices to landowners for management of upland areas to reduce runoff of sediment and other wastes. Site-specific recommendations for management 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 (FOTG) 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.

## **Streamside Management**

A landowner or operators 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 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.

**(5) Streamside Management, no later than January 1, 2006, 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 ranges from ten feet to 100 feet from the water, 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 reestablishment 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.

## **Irrigation Management**

Diversion of water from a waterbody to be applied on land for the purpose of growing crops is a recognized beneficial use of water. Irrigation water use is regulated by the Oregon Water Resources Department (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.

**(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 may be some positive benefits occurring from flood irrigation. These may 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.

# IMPLEMENTATION STRATEGIES

The Department and District intend to encourage participation in this water quality improvement program by providing the following:

## Educational Program

The objective of an educational program 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 the District's 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

## 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 Natural Resources Conservation Service (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.

## Conservation Planning

The District, 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.

## Sources of Financial & 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 is available from these and other sources:

- Technical Assistance
  - NRCS – planning, design, implementation
  - Soil & Water Conservation District – planning, design, implementation, grant writing
  - Watershed Councils – planning, implementation, grant writing
- Workbooks and Publications
  - Voluntary Conservation On Your Land, NRCS/Oregon Association of Conservation Districts (OACD)
  - Oregon Small Acreages Conservation Toolbox, NRCS/OACD
  - WEST Program Workbook, Oregon Cattlemen’s Association (OCA)/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

## Monitoring and Evaluation

Changes stimulated by the implementation of an Area Plan can be measured through monitoring of water quality change over time. Monitoring provides the data by which the direction, degree and rate of change can be determined and can assist in identifying treatment priorities.

Monitoring is the tool by which water quality management practices are evaluated to make sure that they produce the desired outcomes, in terms of protecting water quality. For the purposes of this Area Plan, four main types of monitoring are accepted. These are:

1. Baseline condition monitoring  
Baseline condition monitoring provides a starting point for assessing water quality trends and for future evaluation of the effectiveness of water quality improvement efforts. Baseline condition monitoring typically includes identification and analysis of data previously and currently collected in the area according to accepted protocols.
2. Water quality trend monitoring  
Water quality trend monitoring can help to track how water quality (typically on a watershed or sub-watershed scale) is changing over time, including after implementation of an Area Plan. It is recommended that trend monitoring follow recommendations in the Oregon Plan Water Quality Monitoring Technical Guide.
3. Effectiveness monitoring  
Effectiveness monitoring will be used to evaluate the effectiveness of specific management practices in reducing losses or loadings of components such as sediment or nutrients. It can be used to evaluate the net effect of the implementation of an Area Plan, and watershed improvement activities on water quality trends. The NRCS can provide information about the effectiveness of various practices in protecting surface and groundwater quality.
4. Compliance monitoring  
Conducted as a part of a compliance investigation, this type of monitoring is specific to individual sites. Site-specific information and data are collected to characterize and quantify the physical setting and land management conditions that relate to a potential violation of a specific rule or standard. Photographic documentation of the suspected problem is typically also included in the assessment. Water samples may be taken for chemical or biological analysis.

The Oregon Plan for Salmon and Watersheds Water Quality Monitoring Technical Guide Book is available to provide technical assistance in developing monitoring programs. This monitoring guide describes local management agency accepted practices for most monitoring activities. Technical assistance can be obtained from the sources listed in the previous section. This guide book describes accepted procedures and protocols for most activities that would be used to conduct baseline condition and trend monitoring on a watershed scale, including development of quality assurance/quality control plans to assure quality of data and protocols for data collections.

## **Area Plan Review**

On a biennial basis, the Committee and the Department will review the implementation progress of the Area Plan and Rules and determine whether the plan is sufficient to meet and address water quality standards. If goals and objectives are being met, no modifications will be required. If deficiencies are noted, the Area Plan and Rules may be revised. If there are any changes to the Area Rules, there will be a public comment period.

The Department, with the cooperation and assistance of the District, the Committee, and the Oregon DEQ, will assess the progress of plan implementation toward achievement of plan goals and objectives. These assessments may include:

- Accounting of the estimated numbers and acreage of operations with voluntary ranch conservation plans and the estimated amount of soil erosion and pollution prevented
- Identification of sources of sediment, heat inputs and other contributors to non-attainment of all applicable water quality standards
- Evaluation of available current water quality monitoring data
- Evaluation of outreach and education programs designed to provide public awareness and understanding of water quality issues
- A review of projects, demonstrations, and tours used to showcase successful management practices and systems
- Evaluation of the effectiveness of technical and financial assistance sources available to the agricultural community
- Review of load allocations as found in Upper John Day Basin TMDL and effectiveness of this Plan in meeting load allocations
- Evaluation of current research and scientifically valid monitoring results and may recommend such monitoring as may be necessary to better quantify current conditions

## **Resolution of Complaints and Enforcement Action**

The Department may investigate complaints against landowners or operators who are alleged to be out of compliance with the Rules associated with this Area Plan. The complaint must relate to a specific site, be filed with reference to the alleged rules being violated, and contain a thorough description of the violation. The complaint must be filed with the Department in writing and be signed by the complainant. The Department will determine if a water quality violation exists, and based on this determination, appropriate action will be taken to remedy the condition. If the landowner is in non-compliance, the Department will consult with the landowner/operator and the District to develop solutions and timelines. The authority and procedures for complaint investigation rests with the Department under provisions of OAR 603-095-2060.

The Department may use enforcement mechanisms where appropriate and necessary to gain compliance with the Prevention and Control Measures. Any enforcement action will be pursued only when reasonable attempts at voluntary solutions have failed. Landowners with chronic or egregious violations of Area Rules will be subject to enforcement action by the Department under authority provided in OAR 603-90-060 through 603-90-120.

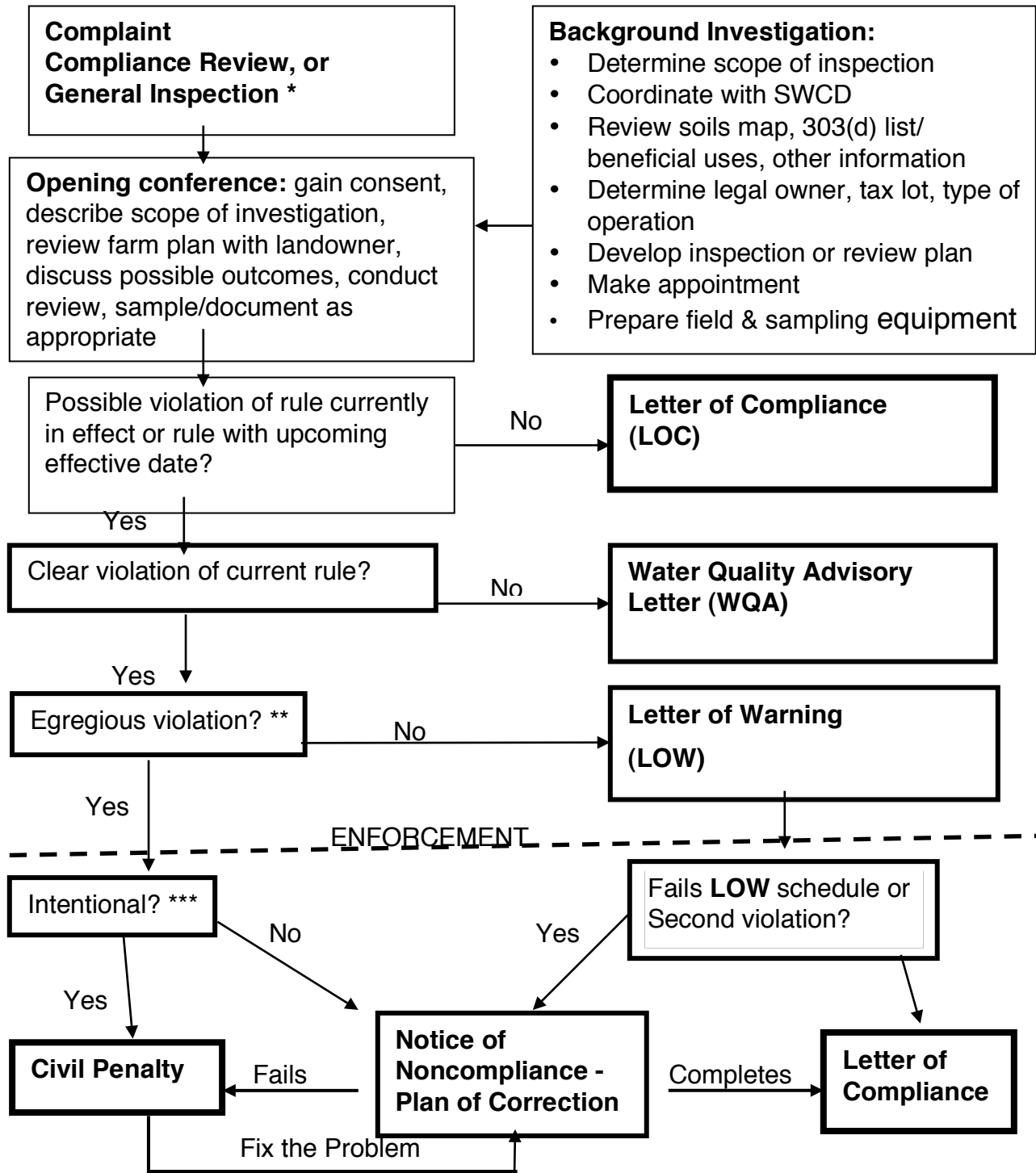
The Department may investigate lands within the management area to determine those actions that may be required of landowners under the Area Rules and to determine whether the landowner is carrying out the required actions. Entry by Department officials onto private property is both authorized and strictly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

## ODA's Compliance Evaluation and Resolution Process



\* General inspection is conducted when a water quality problem cannot be traced to a single property. It may involve outreach and education to landowners in the area as well as monitoring.

\*\*Egregious means Flagrant, Reckless, or Negligent behavior (OAR 603-0090-0060 (2), (5), or (10)) that results in a High Level Gravity of Effect (OAR 603-0090-0110 (5)(a).

\*\*\*Intentional means conduct by a person with a conscious objective to cause the result of the conduct.

### **Letter of Compliance**

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

### **Water Quality Advisory**

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

A Water Quality Advisory letter includes a description of the conditions that have the potential to violate the Area Rules, the statute or rule that may be violated, consequences of future documented violations, and a schedule of recommended corrective actions. The letter may also refer the landowner to other sources of technical assistance, and summarize other issues discussed during the investigation. The inspector will usually follow up to see if the changes effectively reduced the potential for a water quality problem.

### **Letter of Warning**

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

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

### **Notice of Noncompliance/Plan of Correction**

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

landowner to take specific steps to correct the problem. An inspector will follow up to confirm the landowner completed the required corrective actions and effectively addressed the violation.

**Civil Penalty**

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

# **ATTACHMENT A**

## **Geographic Area and Physical Setting**

### **Upper Mainstem John Day Basin**

#### **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 administers 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). A checkerboard pattern of private and federally managed lands characterizes the Upper Mainstem subbasin above Deardorf Creek. These are mostly timberlands.

The Department of State Lands, Department of Forestry and OR 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. Special federal management area is the Strawberry Mountain Wilderness Area, 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	<u>14,000</u>
	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 Area

Strawberry Mountain Wilderness Area

### Resources

The economy of the Upper Mainstem 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 2.5 to 3.5 tons per acre for grass hay. An acre of irrigated pasture can produce six to 15 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. Grass hay production is about 1.5 tons per acre.

#### 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).

In 1958, total log production in Grant County was 240 MBF, Scribner rule. The previous ten years log output averaged 225 MBF annually, ranging from 154 million in 1949 to 285 million in 1956. At that time, 90 percent of saw-timber volume was federally-owned (12,185 MBF Scribner). Private ownership saw-timber was estimated at 1,352 MBF Scribner. Privately owned forestlands in Grant County produced more than half the county's log production during

the 1949-1958 period. Gross standing timber by volume on the Malheur National Forest for 1959 was 11,641,500 MBF. (*Forest Statistics for Grant County, Oregon* - Forest Survey Report 137, Nov. 1960). For 1994, the gross standing volume was 11,917,597 MBF. By 2000, the volume of timber sold on the Malheur National Forest was reduced to 13,502 MBF. (Malheur National Forest Information Derived from Historical Sources and Reports by William L. McArthur, USDA Forest Service Silviculturalist).

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 8 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 on the Forest. (Malheur National Forest Information Derived from Historical Sources and Reports by William L. McArthur, USDA Forest Service Silviculturalist).

Between 2001 and 2010, 211,842 acres was consumed by wildfire and 260 MBF of commercial timber harvest was generated on the Malheur National Forest. The largest acreages were burned in 2007 totaling 142,267 acres. Peak timber production volume was in 2004 at 63 MBF with the salvage sales from 2002 fires. The low volume was in 2002 at 2.6 MBF. (Private communication from Roy Walker, Malheur National Forest, March 14, 2011)

### 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 valuable chromite ore were mined from the rock outcrops along the north slope of the Strawberry Range.

Approximately 716 acres were dredged in the area above John Day and below Mt. Vernon. Data on the number of acres in the Prairie City area was not available at this time.

Prairie Wood Products in Prairie City has constructed a biomass-fired cogeneration 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. The mill is expected to use about 120 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 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), and Joaquin Miller Hot Springs (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.

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 peaking in the mid 1990's. 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. Populations in March of 1999 were estimated at approximately 9,800 deer and 1,500 elk. The population estimates for 2010 demonstrate that elk numbers have remained stable at 1,500 and deer numbers have receded to 9,000 (Private communication from Ryan Torland, ODFW, March 11, 2011).

There is a resident antelope herd in the subbasin that summers in the John Day Valley above Picture Gorge. During severe winters these antelope move west of Battle Creek toward the Antone Ranch. Population size is approximately 200 animals.

There is a resident population of approximately 100 California bighorn sheep in the subbasin. The herd range is from Riley Creek to Fields Creek. These bighorn were re-introduced into the area in 1988.

A small population of Mountain Goats has also established in the Strawberry Mountain Wilderness consisting of approximately 40 animals.

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

As many as 1,500 adult spring Chinook salmon and 3,200 adult summer steelhead return each year to the Upper Mainstem John Day subbasin to spawn. The subbasin produces about 23 percent of the total John Day spring Chinook and about 16 percent of its summer steelhead population. The subbasin contains approximately 100.5 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 Upper Mainstem John Day River continue to improve, it is likely that the extent of spring Chinook spawning and rearing habitat will expand farther into tributaries. Spawning surveys show an increase in the spring Chinook population, but continued low returns for summer steelhead, which continue to be listed as threatened under the federal Endangered Species Act (ESA). (Private communication from Jeff Neal, ODFW, March 10, 2011)

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

Spring Chinook enter the drainage in spring (April through May) but do not reach spawning ground until late 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. (Private communication from Jeff Neal, ODFW, March 10, 2011)

### Recreation and Tourism

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.

### Grazing

Historical information indicates that the relative numbers of domestic grazing animals varied considerably over the years subsequent to settlement in Grant County. Animal Unit Months (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

(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

### Water Resources

The South Fork, Beech Creek, Canyon Creek, Strawberry Creek, and Dixie Creek are major tributaries that contribute to the John Day River flow recorded by the Picture Gorge gauge. Annual average discharge at Picture Gorge is 346,000 acre-feet; 22.8 percent of the basin yield. The South Fork contributes about 100,000 acre-feet per year; 6.6 percent of the basin yield. Irrigation water requirements of the Upper Mainstem account for 11 percent of the total annual flow measured at Picture Gorge. Minimum flow requirements account for 23 percent of the total annual flow measured at Picture Gorge. Water rights for irrigation cannot be satisfied in the late season. Instream water rights are frequently unsatisfied in August and September. (*Stream Restoration Program for the Upper Mainstem of the John Day River, March 1992*) Recent 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. The North Fork average discharge over 75 years is 1,305 cubic feet (945,500 acre-feet); 62.4 percent of the basin yield. (*USGS, Water-Data Report OR-00-1*)

Other gauged streams in the subbasin are Strawberry Creek, the John Day River near John Day, Canyon Creek (since 1980), John Day River at Blue Mt. Hot Springs near Prairie City, South Fork John Day River below Smokey Creek near Dayville, South John Day River above Dry Pine Creek near Izee, Murderer's Creek near Dayville, and Deer Creek near Izee. Beech Creek was previously gauged but only for a few years during the 1930s.

The distribution of subbasin discharge is uneven. Peak discharge generally occurs between March and early June, and lowest flows occur during the months of August and September.

The Upper Mainstem contains most of the basin's natural slack water resources -- Strawberry, Little Strawberry, Magone, Slide and Little Slide lakes, and Canyon Meadows Reservoir near the head of Canyon Creek.

#### Water Use and Control

Irrigation is the dominant water use in the Upper Mainstem subbasin. Although there are rights to apply 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.

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. 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.

Water quality is generally good. Water quality suffers during high-and-low-flow periods. The major water-quality conflict centers on fisheries impacts.

John Day Basin Reservation -- In October 1992, the District requested that the Department reserve unappropriated water in the John Day Basin for future economic development as allowed by ORS 537.356. The Department subsequently requested reservation of 60,000 acre-feet of live flow for irrigation and 124,465 acre-feet for storage: 85,000 acre-feet 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; and 13,465 acre-feet for fishery. A Department Columbia and Snake River Study, dated November 30, 1992, lists five storage sites totaling 17,975 acre-feet on the Upper Mainstem John Day and three sites on the South Fork totaling 6,100 acre-feet.

OAR Chapter 690, John Day Basin Plan, lists as an objective, "(A) Achieve better seasonal distribution of runoff to reduce high stream-flows and increase low stream-flows. (i) Provide for structural and non-structural storage." The Water Resources Commission John Day River Basin Plan Policies encourages "Development of storage reservoirs that are beneficial to anadromous fish and other uses."

Beginning in March of 1999, WRD held public scoping meetings in John Day to determine whether or not water users in the John Day basin wanted to continue with rulemaking on the application for reservation. A second meeting in May 1999, was not well attended and it was decided that a hearing would be called as a special county court session. All counties, municipalities and citizens would be invited to participate in the important decision. As of November 28, 2001, the issue remains unresolved.

## South Fork Subbasin

### Climate

The climate is semi-arid with precipitation ranging from ten to 20 inches per year. Precipitation at Dayville averages about 12 inches per year. Peak precipitation occurs between November and January as snowfall, with a secondary peak of rain in May and June as a result of localized thunderstorms. The annual average temperature at Dayville is 50°F. The coldest average monthly temperature (34°F) occurs in January and the warmest (69°F) occurs in July. 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.

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.

South Fork Subbasin Landcover

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

There is very little urban land in the subbasin. Dayville, the only city in the subbasin, has a population of 138 (according to 2000 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.

### **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. (Private 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

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

Historically, deer numbers in the subbasin peaked between 1955 and 1970 with easily five times as many deer as are present today. From the 1900s through 1960, elk were virtually non-existent throughout the subbasin. Since 1960, there has been a steady increase in elk numbers, which peaked in the mid 1990's. Populations in March of 1999 were estimated at approximately 8,100

deer and 1,750 elk. The population estimates for 2010 demonstrate that elk numbers have risen to 2,000, while deer numbers have receded to 4,000 (Private communication from Ryan Torland, ODFW, March 11, 2011).

There is a migratory antelope herd of approximately 150 head that summers in the Murderers Creek Basin.

There is a resident population of approximately 120 California bighorn sheep in the subbasin. The herd range is from the Smoky Creek drainage to the Murderers Creek drainage east of the South Fork and Black Canyon on the west side. These bighorn were re-introduced into the area in 1978 and supplemented in 2009.

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.

#### Fish Resources

The South Fork Subbasin currently produces approximately 7 percent of the total John Day steelhead populations as well as a substantial resident trout fishery. Annually, between March 15 and June 30, as many as 1,400 adult steelhead spawners migrate into the South Fork drainage where approximately 95 miles of spawning and rearing habitat exist. Juveniles rear in the subbasin for two to three years before migrating out. Resident trout populations generate 3,000 to 5,000 recreation days annually with a sport catch of over 10,000 fish. The subbasin supports a small but growing spring Chinook population. Izee Falls prevents migration of anadromous fish. Steelhead runs are restricted to habitat below Izee Falls River Mile (RM) 27.5. Major steelhead production streams in the drainage are Murderers, Tex, Deer, Wind and Black Canyon creeks.

#### Recreation and Tourism

The South Fork Subbasin is an area that has seen relatively little recreational development. 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 Oregon's 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.

## **Ongoing Watershed Restoration Efforts:**

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, Soil and Water Conservation Districts, Watershed Councils 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)

# **ATTACHMENT B**

## **References to information used in the development of the Area Plan**

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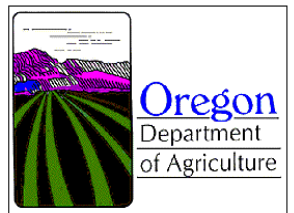
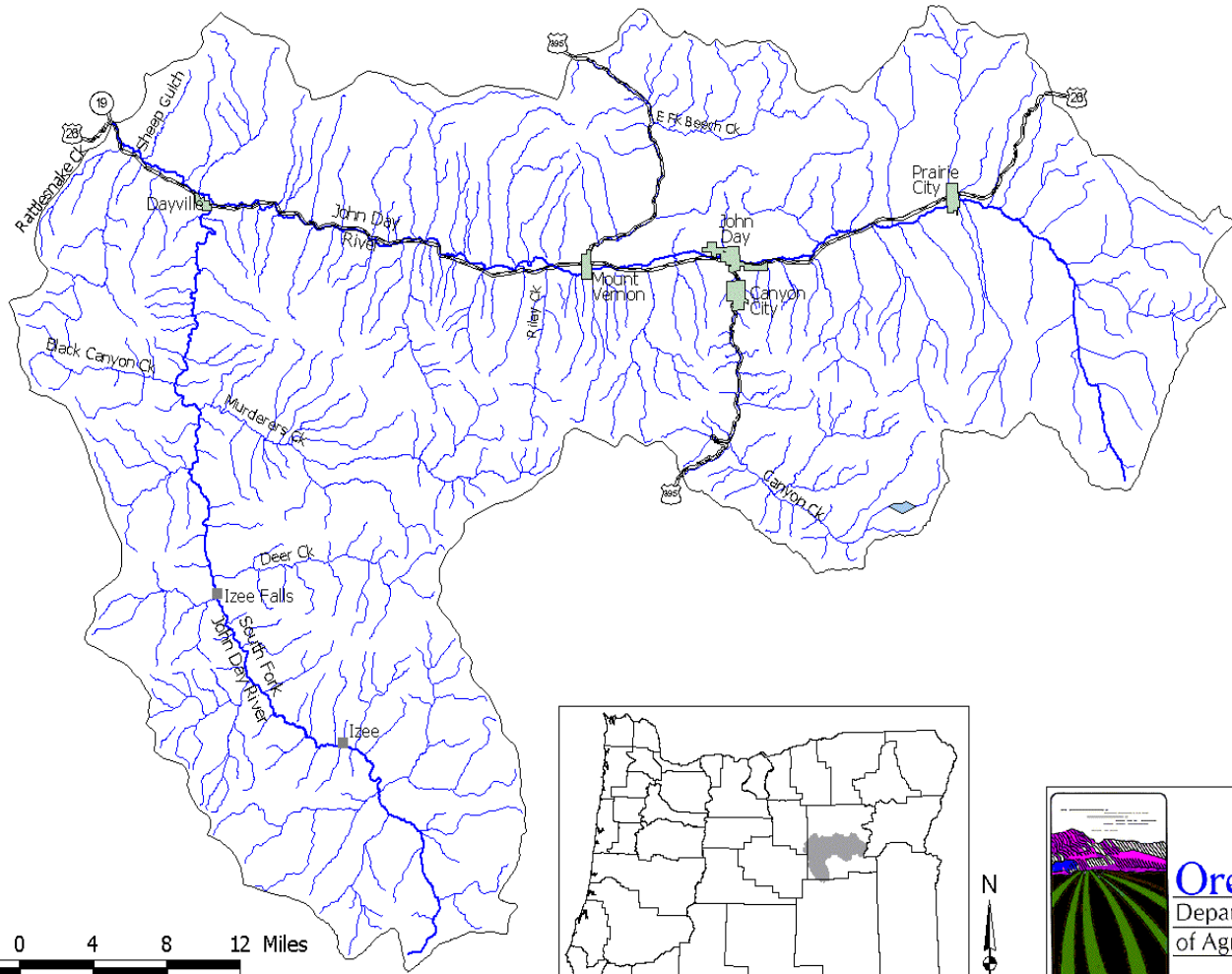
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Water Quality Monitoring: Technical Guide Book, OWEB, July 1999

WESt Program Workbook, Oregon Cattleman's Association, 1998

# ATTACHMENT C

## Upper John Day Agricultural Water Quality Management Area



Natural Resources Division  
March 1, 2002  
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