CROOKED RIVER AGRICULTURAL WATER QUALITY MANAGEMENT AREA PLAN

3rd Biennial Revision

January 12, 2010

Developed by the

CROOKED RIVER
LOCAL ADVISORY COMMITTEE

with assistance from

OREGON DEPARTMENT OF AGRICULTURE
and
CROOK COUNTY SOIL AND WATER CONSERVATION DISTRICT

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FOREWORD

The Oregon Department of Agriculture (ODA) is responsible for developing agricultural water quality management area plans throughout Oregon. This Crooked River Agricultural Water Quality Management Area Plan (Area Plan) provides guidance for addressing agricultural water quality issues in the Crooked River Agricultural Water Quality Management Area (Management Area), as required by state and federal law (Attachment B). The purpose of this Area Plan is to identify strategies to enhance water quality and minimize water pollution from agricultural lands.

This Area Plan is used by local Soil and Water Conservation Districts (SWCDs) to guide their implementation, outreach, and assistance efforts and by landowners to enhance their awareness and understanding of water quality issues.

The provisions of this Area Plan do not establish legal requirements or prohibitions. However, the Area Plan cites associated Oregon Administrative Rules (OARs) for the Management Area (known as the Area Rules) that does establish legal requirements.

ODA uses regulatory measures as a last resort when voluntary approaches do not adequately protect water quality. ODA exercises its enforcement authority for the prevention and control of water pollution from agricultural activities under the Area Rules (603-095-3400 through 603-095-3460) and state-wide enforcement procedures provided in OARs 603-090-0060 through 603-090-0120.

The Area Plan consists of guidelines and recommendations. Management consistent with the Area Plan does not guarantee compliance with the Area Rules or with regulations, including the Oregon Forest Practices Act or Federal Endangered Species Act, administered by other State or Federal agencies.

APPLICABILITY

This Area Plan applies to agricultural activities on all agricultural, rural, and forestry lands within the Management Area that are neither Federal nor held in Tribal Trust. The Area Plan also applies to agricultural lands in current use, those lying idle or on which management has been deferred, and lands (like private roads) not strictly in agricultural use but that support agricultural activities.

AREA PLAN DEVELOPMENT

ODA is the Designated Management Agency for controlling pollution from agricultural activities on agricultural, rural, and forestry lands in the Management Area. ODA is authorized to develop and carry out a water quality management plan for any agricultural or rural lands, where a water quality management plan is required by state or federal law.

The Crook County SWCD is the Local Management Agency (LMA) for the Area Plan. It assists with administration, outreach, and providing technical assistance to landowners. The Crook County SWCD coordinates with adjacent SWCDs to assist landowners in other counties.

The Crooked River Local Advisory Committee (LAC) assisted ODA with the development of this Area Plan and Rules. The LAC reconvenes biennially to review the Area Plan and Rules

and amend them as necessary. Any future amendments will include the public participation process outlined in Oregon Law.

LAC members represent the interests of local landowners, producer groups, agricultural businesses, biologists, Crooked River Watershed Council, Crook County, and the Crook County SWCD. Members are:

Lawrence Weberg, *Chair*: Lone Pine, retired rancher	John Morgan: Foley Butte, private timberlands
Greg Bedortha, *Vice Chair*: Paulina, cattle	Russell Rhoden: Prineville, Ochoco Irrigation District
Mylen Bohle: Prineville, Extension Agronomist	Barbi Riggs: Prineville, Livestock Extension Agent
Doug Breese: Ochoco Creek, cattle and hay	Bill Sigman: Lower Crooked, cattle, hay, grain and mint
James Cox: McKay Creek, cattle and SWCD	
Tim Huntley: Crook Co. High School, Trout Unlimited	Alternates:
Jerry McBeth: Prineville, ranchhand	Jim Eisner: Bureau of Land Management
John Morgan: Foley Butte, private timberlands	Matt Smith: Paulina, cattle

The LAC receives additional technical support from local, state, and federal agencies; and others.

MISSION

Promote cost-effective agricultural management practices that maintain or enhance water quality in the Crooked River Management Area.

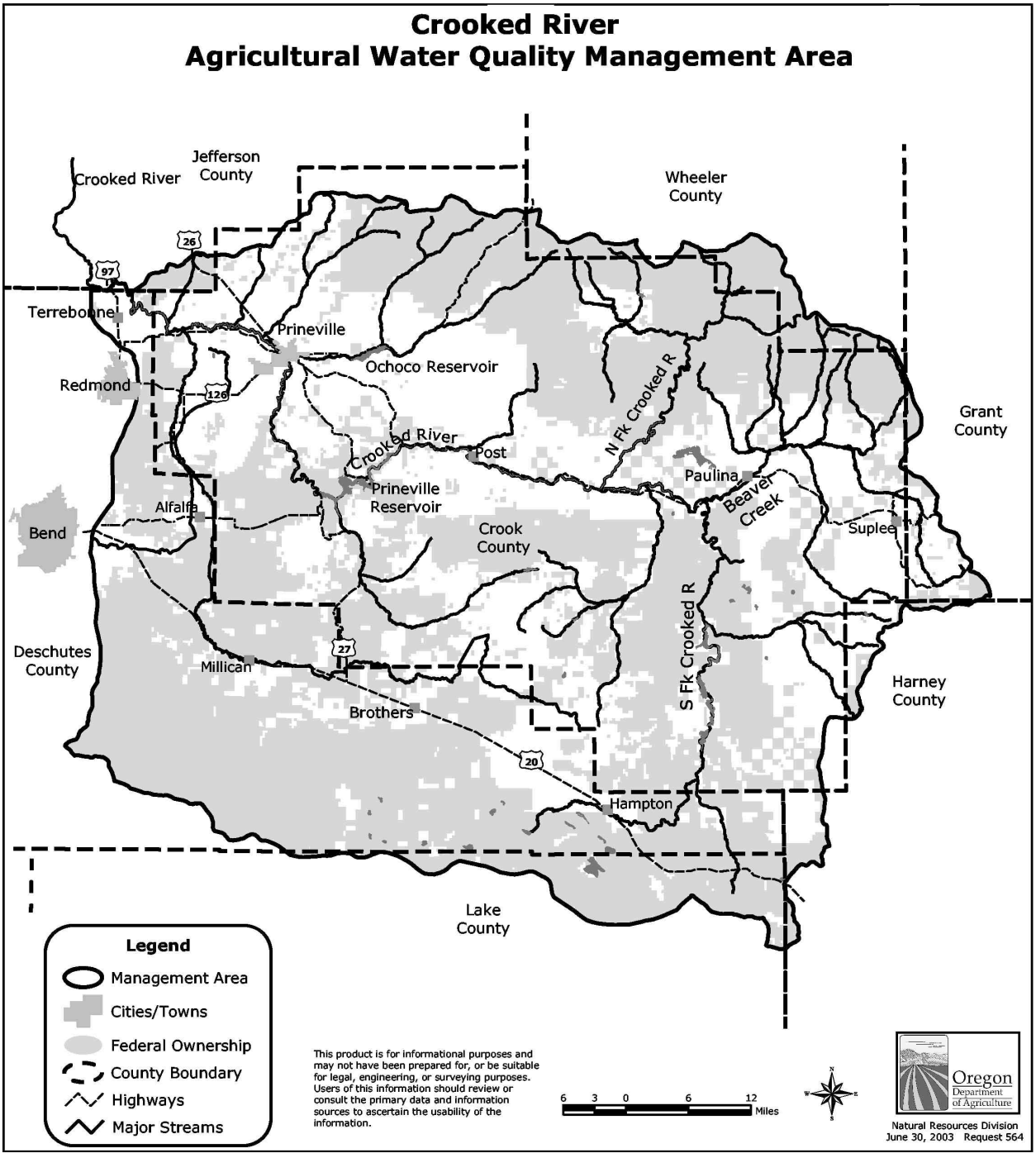
GOAL

Prevent and control water pollution from agricultural activities and soil erosion through education and voluntary implementation.

OBJECTIVES

- Provide landowners with information and technical and financial assistance to minimize agriculture's contribution to water quality concerns (Section 5).
- Pursue and identify cost-effective juniper-control and range improvement projects to improve watershed health.
- Continue to include landowners, land managers, and the communities in the revisions and implementation of the Area Plan and associated Area Rules.
- Inform the general public about how agriculture benefits the community.
- Inform members of the community of everybody's effects on water quality within the Management Area.

MAP


Crooked River
Agricultural Water Quality Management Area
Jefferson County
Crooked River
Wheeler County
Terrebonne
Prineville
Ochoco Reservoir
Redmond
N Fk Crooked R
Grant County
Crooked River
Post
Paulina
Prineville Reservoir
Beaver Creek
Alfalfa
Bend
Crook County
Suplee
S Fk Crooked R
Deschutes County
Millican
Harney County
Brothers
Hampton
Lake County
Legend
Management Area
Cities/Towns
Federal Ownership
County Boundary
Highways
Major Streams
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
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Oregon Department of Agriculture
Natural Resources Division
June 30, 2003 Request 564

1: MANAGEMENT AREA[1]

GEOGRAPHIC AREA & PHYSICAL SETTING

Location

The Management Area is in central Oregon and consists of the Crooked River Basin, except for the Crooked River Ranch area near the mouth of the Crooked River and the Trail Crossing area west of Smith Rock. (The Crooked River Ranch area is in the Upper Deschutes Management Area, and the Trail Crossing area is in the Middle Deschutes Management Area). The Management Area encompasses approximately 4,500 square miles (2.9 million acres) and includes the towns and communities of Terrebonne, Powell Butte, Prineville, Paulina, Post, Suplee, Alfalfa, Millican, Brothers, and Hampton (see map). The Management Area includes portions of 7 counties.

Table 1: Counties within the Management Area	
County	**% of Management Area**
Crook	64
Deschutes	26
Grant, Jefferson, Harney, Lake, Wheeler	1 - 4% each

The Management Area includes a wide range of ecological conditions, from moist forest in the north and east to desert in the west and south. Landforms include valleys, plains, foothills, the Maury and Ochoco mountain ranges, headwaters, and downstream watersheds.

The highest point is Snow Mountain (elevation 7,162 feet) on the southeastern boundary of the Management Area near the Harney County Line. The lowest point is near the mouth of the Crooked River, with an elevation of approximately 1,900 feet.

Climate

The Crooked River Basin is located in the South Central Oregon climatic zone; a semi-arid area of high desert prairie punctuated by small mountain ranges and isolated peaks. Average annual precipitation is between eight and 10 inches per year at lower elevations and may reach 30-40 inches at higher elevations (falling primarily as snow in the winter). The highest monthly precipitation totals occur in the winter months, with a secondary maximum during the late spring and early summer (Figure 1). High intensity thunderstorms can contribute large proportions of annual rainfall locally and contribute to increased erosion. As distance increases to the east, away from the Cascade Mountains, the spring-summer peaks become much more pronounced.

Climate is characterized by cold nights throughout the year, particularly at higher elevations, and hot daytime summer temperatures (Figure 2). Summer daytime temperatures are quite warm at lower elevations, but the growing season is relatively short, particularly at higher elevations, and frost has been recorded in every month.

Mean annual temperatures, total precipitation, and snowfall vary widely from year to year (Figures 3 and 4). Precipitation at higher elevations follows the general patterns recorded at Prineville, except that there is more rain and snowfall.

Figure 1. Monthly precipitation patterns at Prineville (1971-2000)[2]

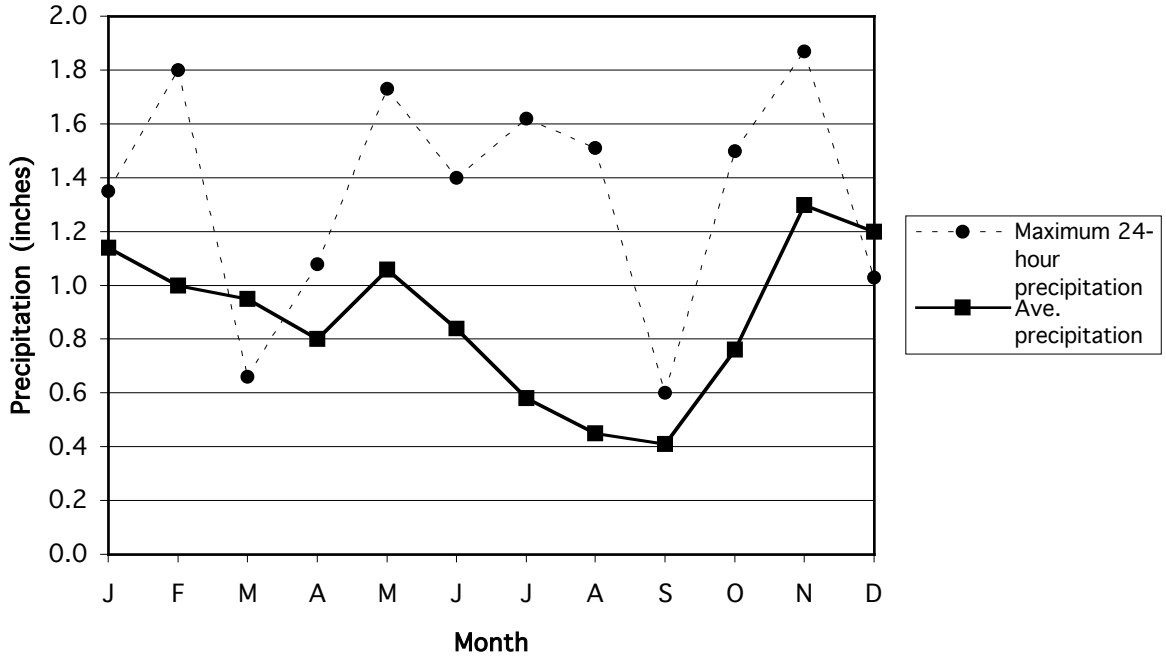


Figure 2. Monthly temperature patterns at Prineville (1971 – 2000)[2]

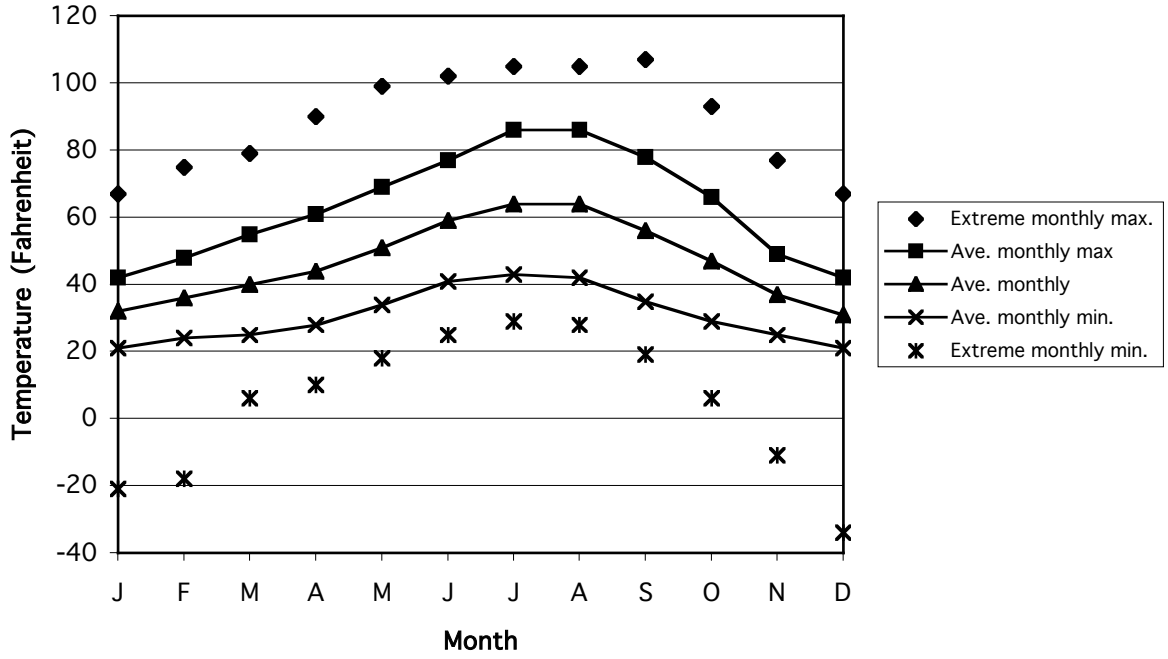


Figure 3. Average annual precipitation at Prineville for 80 years[2]

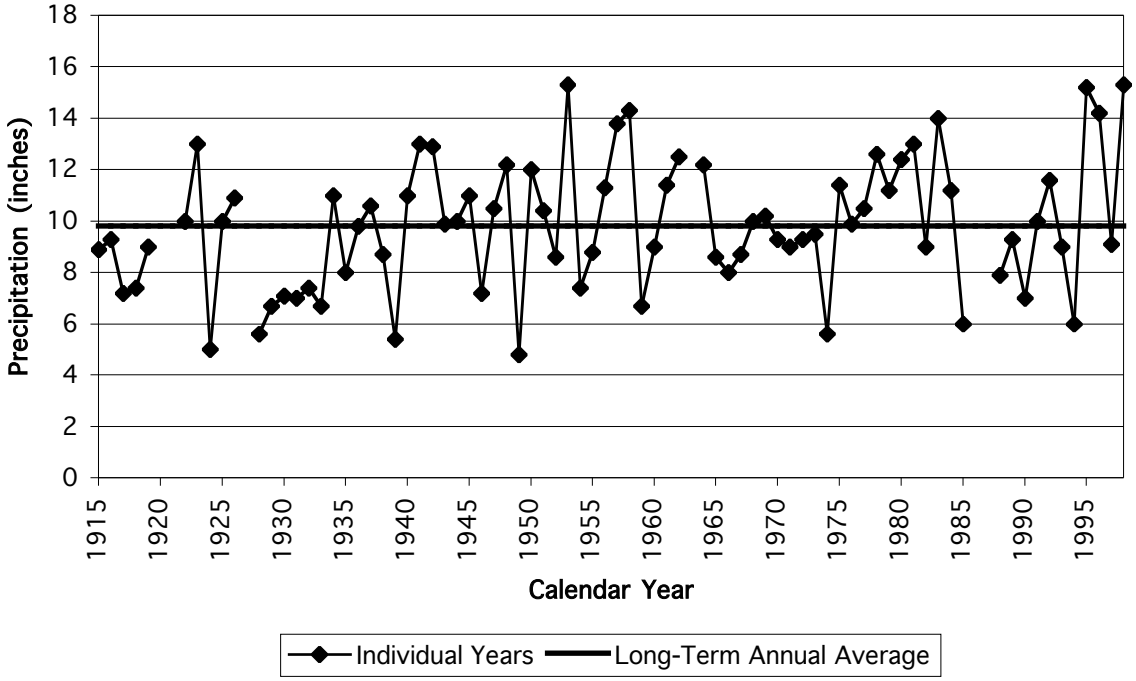
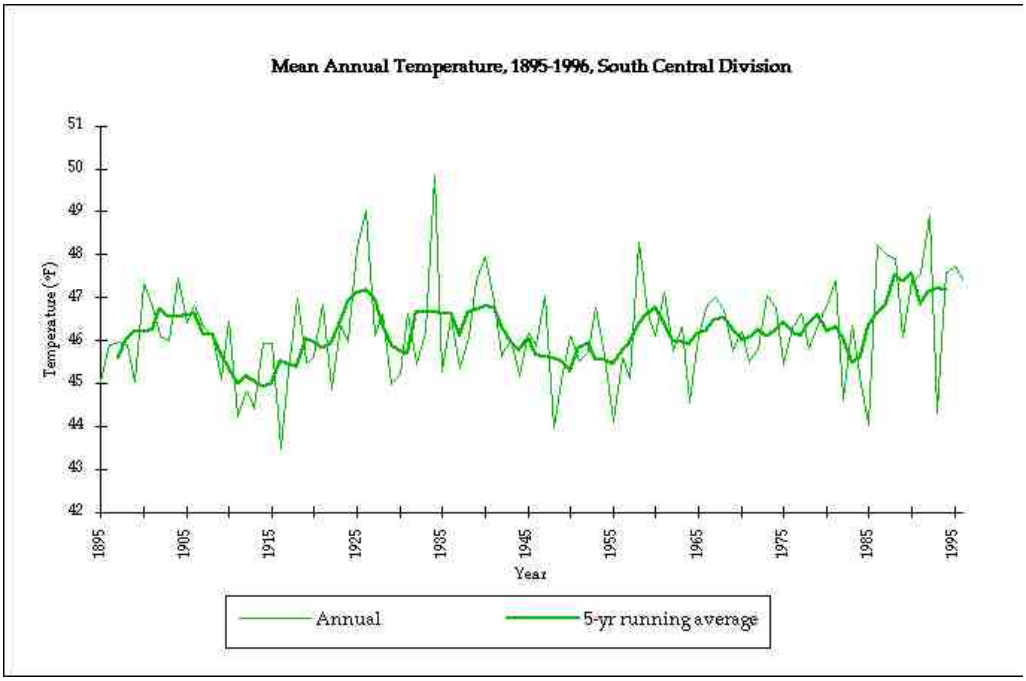
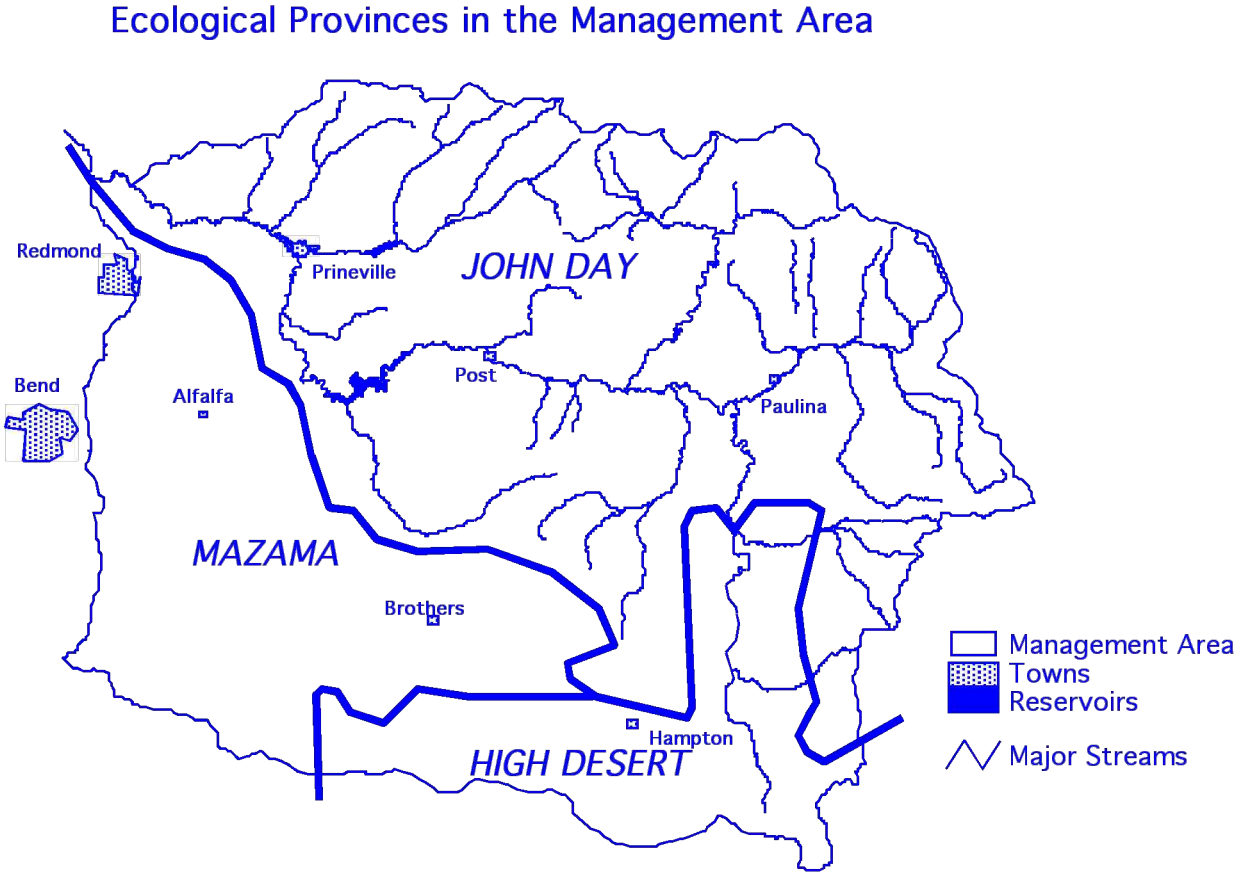


Figure 4. Average annual temperatures in south central Oregon[3]



Ecological Provinces: Geology, Soils and Vegetation Patterns

The Crooked River Basin includes three ecological provinces, which are based on broad soil/plant relationships determined from a combination of geologic and ecological features.



The **John Day ecological province** is characterized by extensive geologically eroded, steeply dissected hills of thick, ancient sedimentary materials interspersed with buttes and plateaus capped with basalt or tuffaceous rock. The majority of the Management Area is located within this ecological province, including the entire Upper Crooked River Subbasin, and most of the Lower Crooked River and the Beaver South Fork Subbasins.

The soils are finely textured, sticky when wet, and highly susceptible to precipitation-driven erosion. Irrigated agriculture occurs around Prineville, but cropland in the remainder of this ecological province is limited to narrow irrigated valleys. Most of the land is used to produce livestock and livestock forage. The original vegetative potential of these sites has been lost or diminished throughout most of the basin, except at relict sites where perennial grasses are present. Control of juniper and noxious weed expansion, and reduced soil erosion can increase the potential for vegetation recovery on these arid rangelands.

The southwestern portion of the Management Area is located in the **Mazama ecological province,** which is covered by a continuous mantle of pumice and other volcanic material deposits distributed when Mt. Mazama erupted explosively about 6,500 years ago. Communities include Alfalfa, Powell Butte, Brothers, Millican, Terrebonne, and the eastern portions of Redmond's urban growth boundary.

Soils have developed in combinations of pumice and volcanic ash overlying basaltic bedrock or ancient soils at a depth from 10 inches to 15 feet. Upland soils are characterized by thick deposits of pumice or pumice overlying loamy soil. Low lying areas include deep, coarse, gravelly pumicy soils of basins and draws in forested uplands, and deep, gravelly loam adjacent to marsh areas.

The overlying pumice mantle is believed to act as a mulch, which aids vegetation. Pumice soils are one of the easiest to modify through management activities, such as compaction from equipment and livestock use. Pumice also weathers more rapidly than other volcanic rock types

Vegetation is typically sagebrush and bunchgrass. Portions of the Mazama province are used for irrigated agriculture.

The **High Desert ecological province** is characterized by closed basins surrounded by terraces formed in ancient lakes. Low mountains, isolated buttes, basaltic ridges, and block faulted igneous formations are interspersed. Elevations average between 4,000 and 4,500 feet. The only community within this province is Hampton.

Soils range from deep loam to deep clayey soils in basins and from deep sandy to shallow clayey soils on terraces and fans where hardpans are common. On most terraces and fans the soil surface is rocky, likely a result of fractured basalt.

The province is a dry and cold region, with an average annual precipitation of approximately 10 inches and a possibility of frost throughout each week of the year. Extremes of hot and cold temperatures are common throughout the province. Vegetation communities are dominated by shrub-grasslands, and the limited conifer areas that are present are dominated by juniper.

HYDROLOGY: RIVER SYSTEM & WATER FLOWS

The Crooked River flows east to west from headwaters in North Fork Crooked River, South Fork Crooked River and Beaver Creek systems. The total length of the Crooked River from the headwaters of the North Fork Crooked River is approximately 155 miles. Average annual discharge of the Crooked River is 1,131,000-acre feet (at Lake Billy Chinook). The streams naturally experience sudden high flows, but are even more prone to flooding now due to suboptimal upland conditions[4].

Natural streamflow is relatively low due to the semiarid climate. Many streams are intermittent. Approximately two-thirds of the total annual precipitation comes in the form of snow during the months of October through April. Large variations occur on an annual and seasonal basis, with snowmelt and summer rainstorms contributing to high runoff and flow events. Tributaries originating in the Ochoco Mountains contribute substantially to the flow of the Crooked River with inputs from both snow and rain. Tributaries originating to the south do not contribute as much water, but can be influenced heavily by high intensity storm events such as summer thunderstorms. Flow within the Crooked River originates from springs in the upper headwaters and lower mainstem, and from snowmelt at the higher elevations.

The South Fork of the Crooked River is formed by the outflow of several springs, some of them hot. The mainstem Crooked River begins at the confluence of the South Fork and Beaver Creek, which receives its flow from springs as well as snow melt and rain from the Ochoco Mountains. Temperatures of springs near Paulina and Suplee have been measured at 70-112°F[4]. The North Fork Crooked River, also fed by springs and snowmelt, adds considerable flow to the mainstem. Springs and tributary streams continue to contribute flow above Prineville. Below Prineville,

there are no known springs of significant size until river mile 15 (downstream of the Management Area) where large springs augment the flow to the confluence.

Bowman Dam creates Prineville Reservoir, and Ochoco Dam creates Ochoco Reservoir. They have multiple benefits: flood control, irrigation, recreation, cooler water temperatures below the dam, summer flows down stream, and redband trout fisheries below the dam. The construction of Bowman dam changed the timing of peak flows as well as their size in the Crooked River. Before construction of the dam, 75 percent of the average flow of the Crooked River occurred in March, April, and May. Natural seasonal flow patterns are altered below both dams, with high flows during the irrigation season when water is released, and lower flows while water is stored for the next irrigation season. Altered streamflow has resulted throughout the basin from the numerous public and private reservoirs created for water storage. Post-reservoir characteristics below large reservoirs such as Ochoco and Prineville include: reduced annual maximum mean flow, elimination of peak high flows, reduction in late winter and early spring flows, and an increase in summer and fall flows. Agriculture in the Lower Crooked River Subbasin depends almost totally on storage behind dams.

A water reallocation plan for Prineville Reservoir may be forth-coming from the Bureau of Reclamation that will address agricultural and non-agricultural land and water uses.

HISTORIC LAND CONDITIONS

In the mid-to-late-1800s, there were more springs and watercourses in the basin. Many streams that are currently intermittent were perennial (for example, Trout Creek in the Paulina/Beaver Creek drainage). There was more riparian* vegetation, including sedges, grasses, and woody species, and stream channels were still well connected to the broad valley bottom floodplains. The Crooked River 'flooded' practically annually, with a meandering channel that took up the entire valley floor.

In the 1800s, riparian and floodplain areas had significantly more woody vegetation than now. Willows were a primary component of riparian species (Ochoco means 'willow' in Paiute) but other common species included cottonwoods, aspen, alder, as well as shrub species such as chokecherry, hawthorn, or dogwood. The floodplains were dominated by Great Basin wild rye, other bunchgrass species, and swamp grass, with very little invasion of juniper and sagebrush.

Vegetation in riparian areas declined rapidly after Euro-American settlement in the basin during the middle 1800s.

The Crooked River and many tributary streams were channelized following the 1964 flood, which disconnected the streams from their floodplains and increased the energy of the streams on the channel banks. In addition, the continued expansion of agricultural and residential developments in the valley bottoms altered stream morphology and vegetation throughout the basin. As a result, many streams eroded vertically or laterally, water tables dropped, sagebrush replaced meadow grasses, and subsequent recovery of riparian vegetation communities is slow. An extensive reservoir and irrigation system has altered the timing and intensity of flows in much of the lower basin, impairing the ability of native vegetation to remain established or re-colonize denuded areas. Ochoco (1921) and Prineville (1961) Reservoirs limit the amount of sediment available in streams throughout the Lower Crooked River sub-basin. Changes in the

* *Riparian areas are a transition between saturated areas and upland areas. Riparian areas are characterized by vegetation that requires permanent surface or subsurface water.*

timing and size of peak and channel maintenance flow events have restricted channel-forming processes in the Crooked River and Ochoco Creek. Natural wetland and riparian areas, particularly within the Prineville urban area, have been filled, removed or relocated, altering the storage and transport of water through this area of the basin and increasing the flashiness of flow events. Roads in the basin generally follow stream courses; many riparian areas are degraded by the presence of roads and road crossings.

In the mid-to-late 1800's, vegetation was more open in both forests and rangelands. Western juniper distribution and density were much less, with juniper restricted to the rocky ridgetops, which are areas naturally resistant to fire. In general, the western edge of the Management Area (in the Mazama Ecological Province) had more juniper than the remainder of the basin. Early journals commonly note the valleys full of waist high grasses and the abundance of forage for livestock. Forests in the Ochoco Mountains had more open Ponderosa Pine stands. Fire was much more frequent and less severe, mostly burning grasses and low ground covers.

Agriculture in the Past

From the time of European settlement in roughly 1870 through the 1930s, livestock grazing was the major land use throughout the entire basin. Initial grazing was dominated by cattle, but sheep moved into the area around 1880. By the turn of the century, the high numbers of sheep, cows and horses were depleting the grasslands, which were being replaced by encroaching sagebrush. Horses were a significant source of range damage in the South Fork Crooked River/Hampton Buttes region of the basin.

The change from native grasses to sagebrush affected the streams. The interaction between high grazing pressure and variable climate (drought followed by intense summer storms), as well as the loss of beaver and its associated habitats, contributed to major stream incision and loss of riparian vegetation in the late 1800 to early 1900s. Farming practices also contributed to the change from native grasses to sagebrush, and increasing livestock management meant that ranchers began growing hay for winter feed. This was accompanied by increasing conflicts over use of the range.

In approximately 1905, the federal forest system was established and grazing in these areas became a permitted activity. Unrestricted grazing on public domain lands ended with the passage of the Taylor Grazing Act of 1934.

The majority of water rights in the upper basin (Paulina/Post) were allocated in the 1880s. Irrigated agriculture took off just after the turn of the century, with major diversion systems installed on the Crooked and Deschutes Rivers in 1908. The mainstem Lower Crooked River, where no springs provide water, and the lower reaches of most small tributaries were dry in late summer and early fall; only the North Fork and uppermost tributaries contained water at this time of year. Overall effects of irrigation expansion included: positive and negative effects on water quality; changed timing of water availability; and fish passage barriers created by dams and diversions.

Historically-used management practices were considered to be the best available at the time to resolve natural resource concerns. For instance, in the 1950s the federal government encouraged the removal of willows in creek bottoms to help the water move through the system faster. Government reports in the late 1970s considered riparian areas to be "sacrifice areas" for livestock grazing. And, the federal government for years had advocated straightening of stream channels.

CURRENT LAND CONDITIONS

Riparian Areas

Stream channelization and land use practices have resulted in downcutting of many of the streams and rivers within the Crooked River Basin. As such, these channels do not connect with their floodplains and water moves quickly through the system. In addition, upland soil and vegetation conditions contribute to flash floods. The "upper country" (Post/Paulina area) of the watershed is heavily impacted by floods due to landscape conditions that lead to flashy floods and a lack of control structures. Prineville and Ochoco reservoirs play a large role in controlling floodwaters in the Lower Crooked River Sub-basin.

Voluntary involvement by private landowners in riparian improvements has increased since the 1960s. Management changes continue to reduce livestock impacts to riparian areas. Primary management changes include riparian fencing to exclude cattle, the creation of riparian pastures and modified grazing schedules, and off-stream water developments to encourage livestock use of upland areas.

These management changes have resulted in increased vegetation in riparian zones; but the composition and extent of the riparian community has not been restored. Particularly at lower elevations, riparian communities in the basin are dominated by non-native grasses or herbaceous vegetation that lacks the root stability of the woody vegetation or sedge communities that existed historically. Restoring riparian function may take a long time due to current channel conditions.

Rangelands

Approximately two-thirds of the land within the Management Area is range. Characteristics include:

- high levels of junipers and shrubs
- expansion of noxious weeds (often worse when cattle are excluded)
- high road densities
- increasing fragmentation between blocks of native range habitat
- fire regimes that are more severe than historical conditions, and
- slow recovery from past damage in lower precipitation regions of the basin.

The Management Area has historically supported juniper, but since 1936, western juniper has spread rapidly throughout the John Day ecological province, and into the Upper Beaver South Fork Subbasin. The spread of this species is primarily a result of the exclusion of fire and intensive grazing pressures at the turn of the century. In addition, juniper has an affinity for calcium, and the clayey ancient sediments of the John Day province are typically calcareous.

Forestlands

Approximately 20 percent of the land within the Crooked River Basin is forested (excluding juniper areas), with the majority contained within the Ochoco and Deschutes National Forests. The current pattern and occurrence of forested vegetation in the Crooked River Basin has changed from historic conditions, which is influencing watershed function and water yield.

Major changes to forest communities in the basin include:

- overall increase in stand density;
- increase in small to medium sized trees;
- shortage of large structure and old trees; and
- increase in the expanse, density, and canopy cover of western juniper and conifers.

Croplands and Irrigated Agriculture

Approximately 5-10 percent of land within the Crooked River Basin is used for irrigated agriculture, and its significance has increased over recent decades due to agricultural and livestock market changes. Irrigated crops within the basin are predominately hay, mint, garlic, seeds, pasture, and grains.

The 20,000+ acres served by irrigation districts near Prineville (Ochoco, Lowline, and People's) receive water stored by reservoirs on the Crooked River. Water applied to irrigated lands west of Prineville (e.g. Terrebonne, Alfalfa, Powell Butte, and Lone Pine) is stored in Deschutes River reservoirs before being delivered to the Management Area. The remaining Management Area irrigators rely on non-stored runoff from healthy watersheds to supply their irrigation needs.

LAND USE

Nearly 60 percent of the Management Area is publicly owned, primarily by the Federal government. The Bureau of Land Management (BLM) manages 35 percent of the Management Area; and the US Forest Service (USFS) manages 23 percent as the Ochoco, Deschutes, and Malheur National Forests. The remaining 26,650-acres of public lands, or 1 percent, are owned by the State of Oregon.

Fifty one percent of stream miles run through private lands, 31 percent run through BLM-managed lands, and 16 percent run through National Forests.

Land use is dominated by agriculture and forestry (over 90 percent), with rural residential comprising the third largest category.

In the late 1970s, 73 percent of the Management Area was classified as range, with grazing as the primary use, 21 percent as forest, 4 percent as irrigated agriculture, and 2 percent as urban and other uses. Since then, the percent of forestlands has remained about the same, but the proportion of irrigated lands has increased relative to the proportion of grazed lands as the economic significance of crops has expanded. In addition, the conversion of agricultural lands to rural residential and urban development is increasing in the Management Area, which could harm water quality due to a lack of comprehensive riparian guidelines.

Livestock grazing is still a major land use in the basin; however, the advent of irrigation in the mid-1900s brought large-scale agriculture to the basin. Soil capabilities, a short growing season, and limited sources and supplies of water for irrigation limit agricultural cropland in the basin.

While the number of farms in Crook County is increasing, from 334 in 1978 to 622 in 2007, the average size of farms is decreasing, down from an average of 2,580 acres in 1978 to 1,224 acres in 2007[5].

Livestock ranching and hay production dominate economic and land use activity in the county. Crop alternatives are severely limited by the availability of water and the short growing season. Potential production of forage is low except in restricted meadows and high precipitation areas. Improved grazing management techniques have resulted in a gradual improvement in range quality over the past few decades.

Recreation is a growing enterprise but the potential is constrained by the distance from populated areas, limited year round access roads, and the seasonal nature of most recreational activities. Reservoirs provide recreation, such as camping, fishing, and boating, that depend on water

quantity and are becoming a key sector of the economy. Also, excellent tailwater fisheries have been created below the reservoirs.

SOCIO-ECONOMIC CONDITIONS

The majority of the Management Area lies within Crook County. The Management Area also includes small portions of Deschutes, Jefferson, Wheeler and Harney Counties. While there are significant differences in the socio-economic conditions between Crook and Deschutes Counties, the areas of Deschutes that lie within this management area are very similar to Crook County.

In 2000, Crook County's population was estimated to be 19,182 people. Portland State University Population Research Center reported that as of July 1, 2009, the population of Crook County had grown almost 42 percent and is now estimated to be 27,185. Of that population, about 38 percent live in Prineville (the only incorporated town in Crook County) with the remainder of the population living in the unincorporated parts of the County.6

Traditionally the economy has been based on natural resources. Forest products (primary and secondary manufacturing) and agriculture have provided the underlying stability to the community. Today, Crook County's economy also includes manufacturing, trade, government, and recreation/tourism.[7]

In 2009, Crook County's unemployment went over 20 percent (peaked at 22.4 percent). Since 1990, Crook County's unemployment rate has always been higher than Deschutes County and the state average for Oregon. In Crook County, significant job losses in the wholesale trade sector (down 46 percent from 2008), wood manufacturing (down 25 percent) and local government (down 11 percent) led the other economic sectors in nonfarm job losses during the last 18 months. Total number of jobs in Crook County is down 11 percent from 2008 and down by 17 percent from the 2007 job market peak in the County.[8]

In 2008, farm gate receipts for agricultural commodities produced in Crook County were $52,381,000.00. Livestock sales (primarily cattle and calves) were 19.4 million and hay sales (alfalfa and other hays) were 27 million dollars. Other major crops for 2008 include garlic, vegetable and flower seed, potatoes, and peppermint.[9]

Section #1: References

[1] *Crooked River Basin Characterization*. Crooked River Watershed Council. 2002.

[2] Oregon Climate Service: http://www.ocs.orst.edu

[3] Graphic from an undocumented website.

[4] Crooked River Local Advisory Committee. Personal communication.

[5] Census of Agriculture. www.agcensus.usda.gov

[6] Portland State University-Population Research Center. www.pdx.edu/prc/annual-oregon-population-report

[7] Crook County Rural Living Handbook, 2009

[8] Oregon Workforce Statistics, http://www.qualityinfo.org/olmisj/OlmisZine

[9] Oregon Agricultural Information Network. http://oain.oregonstate.edu

2: WATER QUALITY

BENEFICIAL USES

The Federal Clean Water Act required states to designate beneficial uses related to water quality that must be protected for the public interest. These beneficial uses of water are codified in OARs and generally apply basin-wide to all waters of the state (Table 1). Waters of the State include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, marshes, inlets, canals, and all other bodies of surface or underground waters, natural or artificial, public or private (except those private waters which do not connect to natural surface or underground waters) within Oregon (from ORS 468B.005(8)).

Table 1. Beneficial uses (related to the Clean Water Act) in the Management Area (OAR 340-41-0130; date 2003).

Beneficial Use	Cooked River Mainstem	All Other Basin Streams
Public Domestic Water Supply[1]	X	X
Private Domestic Water Supply[1]	X	X
Industrial Water Supply	X	X
Irrigation	X	X
Livestock Watering	X	X
Fish & Aquatic Life[2]	X	X
Wildlife & Hunting	X	X
Fishing	X	X
Boating	X	X
Water Contact Recreation	X	X
Aesthetic Quality	X	X
Hydropower	X	

[1]With adequate pretreatment (filtration and disinfection) and natural quality to meet drinking water standards.
[2] Figures 130A and 130B in OAR 340-41-0130 indicate where specific salmonid Beneficial Uses are designated. All streams in the Crooked River watershed appear to be designated for "Salmon and Trout Rearing and Migration"; no streams are designated for "Salmonid Spawning".

Beneficial Uses Most Likely to be Adversely Affected

The focus of this Area Plan is to encourage the positive management of streams, riparian areas, and uplands to support beneficial uses of the water. Salmonids, resident fish, and aquatic life are the most sensitive beneficial uses for a number of water quality parameters (including temperature, sedimentation, turbidity, nutrients, pH, and dissolved oxygen). The bacteria standard protects the beneficial use of Water Contact Recreation.

Salmonids (includes salmon and trout)[1]

The Pelton-Round Butte Dam complex was completed in 1968 on the Deschutes River, below the mouth of the Crooked River. Before completion of the complex, summer steelhead, spring chinook salmon, bull trout and redband trout were historically present. The first formal fish surveys took place in the 1950s after substantial habitat and population declines had already occurred. Despite 75 years of major habitat changes, the 1952-54 surveys located steelhead up to 120 miles from the mouth of the Crooked River. Historical accounts indicate that most salmon and steelhead in the Upper Deschutes Basin historically spawned and reared young in the main tributaries: Crooked River, Wychus Creek, and Metolius River. The completion of the dam complex eliminated upstream passage of anadromous fish to the Crooked River Subbasin. However, the offspring of wild redband were reintroduced into the South Fork and are starting to naturally reproduce. It is also likely that wild redband have naturally repopulated the South Fork. The renovation of the Opal Springs hydroelectric facility in 1980 limited bull trout movement into the Crooked River from the Deschutes River. However, steelhead are now being reintroduced to the Management Area as a result of the relicensing of the dam complex.

WATER QUALITY PARAMETERS OF CONCERN

Water quality conditions within the Crooked River Basin are highly variable, with higher elevation streams in the Ochoco Mountains generally having good to excellent water quality, and lower elevation sites having lower overall water quality[1]. Primary contributors to the poor water quality are related to land and water conditions such as: low summer flows, the existence of reservoirs and diversions, degraded upland and riparian vegetation, and stream channels that lack stable banks and connection with the floodplain. Land uses that can influence water quality in the basin include logging, roads, grazing, irrigated and non-irrigated agriculture, confined feeding operations, recreation, urban and rural residential development, reservoirs, and seasonal sewage treatment plant activities.

The Department of Environmental Quality (DEQ) currently maintains two water-quality monitoring stations on the Crooked River, located at Lone Pine Road (30 miles above the mouth) and Conant Basin Road (92 miles above the mouth of the Crooked River and approximately 6 miles above Prineville Reservoir). Through 1993, DEQ monitored an additional station on the Crooked River at Highway 126 on the west edge of Prineville, 48 miles above the mouth. The US Forest Service and BLM monitor water quality on their lands in the Management Area. The Crooked River Watershed Council has also started monitoring stream temperatures throughout the watershed.

Documented Water Quality Concerns

Streams that do not meet state water quality standards are placed on the 303(d) list by DEQ. The last 303(d) list was finalized in 2006; Information on the 303(d) list can be found at: *http://www.deq.state.or.us/wq/assessment/rpt0406/search.asp*.

Primary parameters of concern are temperature, pH, bacteria, and total dissolved gas (Table 3). Because data have been collected from relatively few sites, the 303(d) list may: 1) not accurately reflect the extent of water quality concerns in the Management Area, 2) overemphasize water quality concerns, and 3) not reflect the capability to meet the state water quality criteria. The next list will be submitted to EPA in 2010.

Table 3. Locations of exceedances of Oregon's Water Quality Criteria in the Management Area as listed on the 2004/2006 list[2]. All exceedances are of the temperature standard unless noted otherwise.

Subbasin	Streams
Lower Crooked River	Crooked River to Baldwin Dam (Mile 0-51) *and pH* Crooked River: Baldwin Dam to Prineville Reservoir (51-70)– *total dissolved gas only* Canyon Creek (0-5.5) Hamilton Creek (0-1.7) Harvey Creek (0-1.4) Little Hay Creek (0-3.6) Little McKay Creek (0-6.7) Marks Creek (0-17.1) McKay Creek (0-19.5) Mill Creek (0-11.5) Mill Creek, East Fork (0-7.6) Mill Creek, West Fork (0-4.9) Ochoco Creek (0-36.4)
Upper Crooked River	Allen Creek (Mile 0-10.1) Bear Creek (0-34.3) Cow Creek (0-7.2) Crazy Creek (0-3.5) Crooked River: Prineville Reservoir to North Fork Crooked R. (82.6-109.2)– *also pH* Crooked River, North Fork (0-44.7)

	Deep Creek (0-10.6) Deer Creek above private reservoir to headwaters (0.9-4) Double Corral Creek (0-5.4) Fox Canyon Creek (0-6.8) Fox Creek (0-4.9) Gray Creek (0-6.7) Happy Camp Creek (0-6.7) Horse Heaven Creek (0-14) Howard Creek (0-9.5) Indian Creek (0-9.1) Jackson Creek (0-5.9) Klootchman Creek (1-5.3) Little Horse Heaven Creek (0-2.9) Little Summit Creek (0-10) Lookout Creek (0-1.5) Lytle Creek (0-4.2) Peterson Creek (0-10.7) Porter Creek (0-4.5) Shotgun Creek (0-5.9) Toggle Creek (0-5.3) Wickiup Creek (0-8.6) Wildcat Creek (0-4.3)
Beaver Creek/South Fork Crooked	Beaver Creek, South Fork (Mile 0-26.4) Begg Creek (0-2.2) Beaverdam Creek (0-10.8) Dippingvat Creek (0-7.7) Dry Paulina Creek (0-13.1) East Wolf Creek (0-3.3) Powell Creek (0-12.7) Rager Creek (0-8.5) Roba Creek (0-7.2) South Fork Crooked River (0-18) Sugar Creek (0-11.5) Wolf Creek (0-17.l) Wolf Creek, North Fork (0-10.3)
Note: River miles are measured from the mouth; the mouth is designated as Mile 0.	

Elevated summer temperatures

Oregon's temperature standard was revised in March 2004 and has several different temperature requirements (criteria), based on the type of aquatic use being supported[2]. Only one currently applies to the Management Area: waters supporting salmonid rearing and migration or other aquatic life should not exceed 64.4˚F. No streams are currently designated in the Management Area for salmonid spawning, which has a criterion of 54.4˚F. However, that will likely change in the lower Crooked River with the reintroduction of the steelhead. The standard allows streams to naturally exceed the target temperature; however, if they do, human activities may not increase the water temperature even more.

Oregon's temperature standard states that "for farming and ranching operations on State or private lands, water quality standards are intended to be attained and are implemented through the Agricultural Water Quality Management Act (ORS 568.900 to 568.933) and rules thereunder, administered by ODA. Therefore, farming and ranching operations that are in compliance with the Agricultural Water Quality Management Act requirements will not be subject to DEQ enforcement under this rule."

Water temperatures are critical to fish growth and survival at all life stages. Warm stream temperatures increase stress and disease, raise metabolism, lower growth rates, and enhance conditions for introduced non-native predators. Temperature affects the dissolved oxygen potential in water - the warmer the water, the less dissolved oxygen it can hold. Fish cope with

thermal stress by adjusting their behavior during the warmer summer months. Sometimes coldwater fish will seek refuge during the heat of the day in nearby cooler waters that are fed by springs or ground water, while others may migrate great distances to seek out the cooler headwaters. Coldwater species of fish also adapt their body structure, chemistry and physiology to become more efficient at the metabolic processes that regulate swimming, avoiding predators, etc. during thermal stress.

Stream temperatures are influenced primarily by direct solar radiation, air temperature, and movement of groundwater into streams[3]. Basic approaches to minimizing increases in water temperature include: provide shade where appropriate, keep the stream narrow, increase volume of water, and keep water flowing. Vegetation affects all these factors, and human activity, depending on the site, may have a direct influence on vegetation.

Elevated pH
Excessive aquatic plant or algal growth can harm fish and other aquatic life by creating extremes in water pH and low levels of dissolved oxygen. (The death and subsequent decomposition of aquatic plants can consume large quantities of dissolved oxygen.) These conditions can be stimulated by the availability of nutrients, warm temperatures and light, which in turn may be acerbated by low stream flows and lack of protective vegetative cover. DEQ monitoring at their two ambient sites indicates high concentrations of nutrients both during periods of low flow (little dilution) and during heavy precipitation (high runoff). Increased nutrient concentrations can affect both in-stream pH and dissolved oxygen.

Spawning and rearing of salmonid fish species are the most sensitive beneficial uses affected by pH. Values of pH outside the range in which a species evolved may result in both direct and indirect toxic effects. Elevated pH levels can cause dramatic increases in toxicity of other pollutants and cause fish kills.

The maximum pH criterion for the Deschutes River Basin is 8.5 because so much of the water comes off the Cascades. However, the Crooked River drains the Ochoco Mountains, not the Cascades, and is therefore more similar geologically to the rest of eastern Oregon, which has a maximum pH criterion of 9. As part of the TMDL process, the LAC believes that DEQ should raise the maximum pH criterion for the Crooked River Subbasin from 8.5 to 9, to reflect the local geology.

Total dissolved gases
The mainstem Crooked River is listed for total dissolved gasses from Baldwin Dam to Prineville Reservoir because of elevated saturation levels below Bowman Dam after periods of high flows. The way the water is released from the dam during high flows is the only believed source of this problem.

Potential Water Quality Concerns
Sediments carried in streams can adversely affect aquatic life by increasing water temperature through thermal absorption, reducing light penetration and visibility, reducing water infiltration through stream substrate (harming incubating fish eggs), and irritating gill filaments. **Turbidity** is a measure of the cloudiness of water and is often used as a surrogate measure for suspended sediment.

Bacteria in the Crooked River has primarily been evaluated based on two DEQ sites – one at Lone Pine Rd in the lower Basin and one above the reservoir at Conant Basin Rd. Based on these data, the mainstem Crooked River was included on earlier 303(d) lists for not meeting the fecal coliform **bacteria** standard from the mouth to Baldwin Dam (one mile above Prineville). In 1996, DEQ started collecting *E. coli* data (instead of fecal coliform) to evaluate bacterial

concerns, based on a new bacteria standard adopted in 1995. Since there were no observed exceedances of the *E. coli* standard in the Crooked River below Baldwin Dam in the data evaluated for the 2004 303(d) list, this section of the Crooked River was taken off the 2004/2006 303 (d) list. Water sampled at the DEQ site above Prineville Reservoir has not exceeded either the fecal coliform or *E. coli* bacteria criteria. Because there has been such limited bacteria data collection in the Crooked River watershed, DEQ conducted a nine-week *E. coli* monitoring study during the summer, 2005, to better assess bacteria water quality concerns. Limited data showed bacteria counts exceeding the standard in the Lower Crooked River at Lone Pine Road, McKay Creek, and Dry Canyon, but the source of the bacteria has not yet been determined. These results will be included in the TMDL work for the watershed. High levels of bacteria can cause human illnesses under the right circumstances. Thus, the most sensitive beneficial use protected by the bacteria standard is water contact recreation (activities such as swimming or fishing where people could swallow or have water touch open cuts or sores). The bacteria standard also does not allow bacteria in numbers high enough to interfere with waters used for domestic purposes, livestock watering, irrigation, or other beneficial uses.

Two other factors related to fish habitat can influence water quality. **Reduced stream flows** can contribute to a general reduction in available habitat and interfere with fish migration. In addition, low flows can contribute to warmer water, increased pH, and reduced dissolved oxygen. Slow-moving streams may be more susceptible to warming and they are less turbulent, all of which can contribute to reduced oxygen levels. **Modification of physical habitat** can harm all aquatic life. Historical channelization reduced the amount of habitat (stream length is usually reduced as meanders are eliminated), as well as the instream habitat complexity such as the normal mixture of pools, riffles, and runs. Loss of riparian vegetation often destabilizes streambanks, which results in increased erosion, increased stream sedimentation, loss of instream habitat complexity and cover, and the loss of future large woody debris that naturally falls into streams.

Section #3: References

[1] *Crooked River Basin Characterization*. Crooked River Watershed Council. 2002.

[2] *Oregon's 2004/2006 Section 303(d) List of Water Quality Limited Waterbodies, distributed for public comment*. Oregon Department of Environmental Quality.

[3] Moore, J.A. and J.R. Miner. *Stream Temperatures: Some Basic Considerations*. Oregon State University Extension Service. EC 1489. May 1997.

3. WATERSHED HEALTH

A healthy watershed captures, stores, and beneficially releases water.

Watershed health results from properly functioning uplands and riparian areas. Most of the capture and storage of precipitation occurs in the uplands, which generally make up 98-99 percent of the watershed area. Healthy riparian areas have sufficient vegetation to stabilize streambanks, filter out nutrients, provide shade, and store moisture in the soil profile. A properly functioning stream transports water and sediment in such a way that the stream channel can withstand a 25-year flood event without excessive erosion.

Capture = Precipitation is captured by vegetation and the soil surface. Fixed site factors that influence the efficiency of capture include: soil texture and depth, topography, and climate. Landowners can enhance the opportunity for water to enter the ground where it falls by managing upland vegetation. Key management objectives are to:

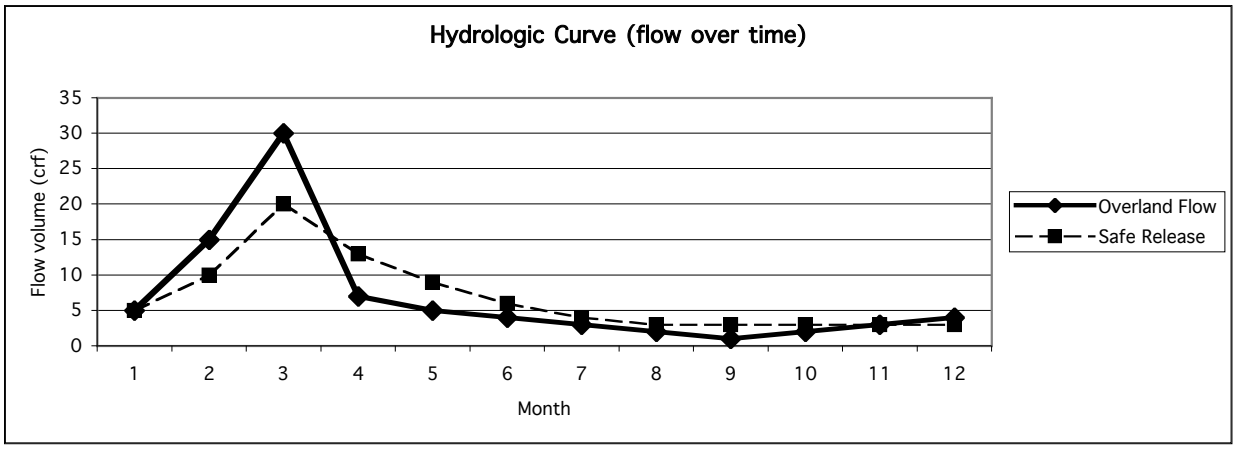
- provide sufficient vegetative cover to reduce raindrop impact and to trap precipitation,
- increase organic litter on top of the soil, and
- improve root mass to enhance permeability.

Storage = Water is stored in the soil profile. Fixed site factors include soil depth, structure, and texture. Management objectives include:

- desirable vegetation with healthy root systems to promote soil structure
- vegetative cover and organic matter to help reduce excess evaporation

Beneficial Release = Water is released beneficially via increased subsurface flows and decreased overland flows, resulting in extended late-season flows and reduced erosion and sedimentation. Management objectives consist of having desirable, vigorous vegetation to promote capture and storage of water.

The overall objective is to moderate peak flows in the spring and to maintain late season flows. This is known as "taking the peak off the hydrologic curve", as shown below.



Vegetation is key to watershed health! Watershed health is key to water quality! Healthy vegetation in both the uplands and in the riparian areas improves soil conditions, which improves water infiltration and reduces soil erosion. This helps to capture, store and safely release water later in the season. Releasing water later in the summer reduces water temperatures in two ways. The first way is that a higher volume of water requires more energy to heat it. Secondly, infusion of groundwater, usually between 45 and 55 degrees F, can help moderate stream temperatures and provide cold water refugia for aquatic life.

THREATS TO WATERSHED HEALTH

Noxious Weeds (see Attachment C)
Noxious weeds are a threat to native ecosystems, competing with native vegetation and changing forage availability for wildlife and livestock. Noxious weeds negatively impact watershed conditions, often leading to increased runoff and erosion[1]. Invasive plant species are also recognized as a serious threat to agriculture, impacting both livestock and croplands. Many landowners are actively controlling or eliminating infestations on their own lands.

Western Juniper[2,3,4,5,6]
Although western juniper is a native plant, the **expansion of western juniper** into rangelands is a primary watershed health concern. Crook County has more than 857,000 acres of juniper (covers over 50 percent of Crook County's rangeland). Juniper expansion has reduced vegetative ground cover, which has contributed to: increased overland flow, loss of topsoil, and sedimentation of streams during high intensity precipitation events. Juniper expansion is also changing vegetation communities and reducing forage availability for livestock and wildlife, in addition to increasing erosion potential. Juniper crowns intercept more than half of the annual precipitation (reduced capture), and juniper transpires water year-round compared to seasonal transpiration of other vegetation (reduced storage). Juniper woodlands have up to 10 times the erosion rate of sagebrush-grass ecotypes.

Juniper were naturally restricted to rocky ridges and cliffs where there was little grass to fuel fires. Juniper expansion is largely a result of fire suppression policies, although land management trends have also accelerated its expansion. Climate changes in the late 1800s and grazing practices supported seedling establishment.

Juniper is recognized as valuable habitat for some wildlife species; so, Oregon's commitment to water quality must include effective control of juniper *expansion*.

Increased Forest Canopy
Forests in the Management Area historically consisted of a diverse mosaic of uneven-aged trees; now they consist more of small trees growing close together. Increased forest canopy often reduces stream flows[7,8,9] due to factors such as increased evapotranspiration and the capture of precipitation by the forest canopy[10,11].

Excessive or Inadequate Sediment
Erosion, sediment movement and deposition are natural watershed processes. Aquatic organisms have evolved with the local natural rate and pattern of erosion and sedimentation. Many streams in the Management Area have naturally high sediment loads due to geology, topography and climate characteristics. This is particularly true for the steeper portions of the basin. One of the most dramatic examples of sediment movement is runoff events associated with thunderstorms.

Land management activities and changes in land cover patterns can accelerate the natural erosion rate and alter the timing and amount of sediment delivered to streams. Primary human-related factors related to increased erosion and sedimentation on non-forest lands include: expansion of western juniper and noxious weeds, irrigation systems, roads, rural residential development, and agriculture. High sedimentation rates within Prineville Reservoir reduce photosynthesis in the reservoir, thereby reducing available food and habitat for fish. While excessive erosion is a concern in many areas of the basin, a lack of bedload and sediment transfer due to Bowman Dam at Prineville Reservoir is a concern for maintenance and restoration of riparian and channel conditions on the lower Crooked River.

4: BENEFICIAL MANAGEMENT PRACTICES

INTRODUCTION

Voluntary efforts are the primary means to prevent and control agricultural sources of water pollution. Landowners in the Management Area are generally aware of water quality concerns and appropriate practices to address those concerns. Many landowners are actively implementing projects to improve upland and riparian conditions.

SWCDs are the main support agencies at the local level. NRCS, Crooked River Watershed Council, Crook County Weed Board, Oregon State University Extension Service and Central Oregon Agricultural Research Center, Deschutes Resources Conservancy, Oregon Watershed Enhancement Board (OWEB), ODA, DEQ, Oregon Water Resources Department (WRD), Oregon Dept. of Fish & Wildlife, Oregon Department of Forestry, US Forest Service, BLM, USDA Farm Service Agency, and others may provide information and/or technical and financial assistance.

Landowners have flexibility in choosing management approaches and practices to address water quality issues on their lands. Landowners may choose to develop management systems to address problems on their own, or they may choose to develop a voluntary conservation plan (e.g. an NRCS-approved farm plan) to address applicable resource issues. Landowners may seek planning and financial assistance from any agency or a consultant.

Natural factors that may limit improvement in land conditions may include area precipitation patterns, soil types, stream channel morphology, upland topography, and invasive plants.

The LAC would like to see a priority placed on development and promotion of economic benefits of juniper control. This would encourage landowners to manage or control juniper, thereby improving watershed health.

MANAGEMENT INTENT

To help achieve water quality standards in the Management Area, an effective strategy should result in:

- **Healthy, productive riparian areas**
- **Healthy, productive uplands**
- **Properly managed croplands**
- **Properly managed livestock**

Site capability is a key concept for vegetation management. *Site capability* is the vegetative condition that can be expected at any given site, based on site potential and human infrastructure. *Site potential* is the highest ecological status of vegetation that an area can attain. Site potential is influenced by physical and biological factors such as elevation, aspect, geology, climate, and the current plant community. It is also influenced by disturbances found in riparian systems, such as flooding. Site conditions that affect the establishment and development of streamside vegetation are further modified by human infrastructure (such as roads, power and telephone lines, and irrigation and drainage systems) and resident wildlife and wild horse use.

Proper Functioning Condition (PFC)[12] is a familiar concept to many landowners in the Management Area. A stream at PFC can withstand a 25-year storm event without excessive bank erosion. Streams at PFC are likely to provide most if not all of the functions required to help achieve water quality standards.

A stream is considered to be at PFC when adequate vegetation, landform, or large woody debris is present to:

- § dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality;
- § filter sediment, capture bedload, and aid floodplain development;
- § improve flood-water retention and ground-water recharge;
- § develop root masses that stabilize streambanks against cutting action;
- § develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and
- § support greater biodiversity.

1. Healthy, Productive Riparian Areas

Healthy riparian areas have appropriate vegetation and stable streambanks. Depending on site capability, these streams also have sufficient structure such as rock and large woody debris to reduce flow velocities and reduce the damage from flooding.

Riparian Vegetation

Riparian vegetation consists of plants that depend on or tolerate the presence of water near the ground surface for at least part of the year. Riparian vegetation can include sedges, rushes, willows, cottonwoods, and other herbaceous or woody vegetation, depending on conditions at the site such as soil type, slope, aspect, stream gradient, and elevation.

Riparian vegetation helps:

- Minimize streambank erosion by increasing the cohesiveness and structural strength of streambanks and by reducing flow velocities[13,14,15]
- Moderate summer water temperature[16,17]
- Maintain later season flows by increasing the ability of the adjacent soils to store water during runoff seasons[18,19,20]
- Filter out and process excess nutrients, bacteria, and sediment in runoff that could pollute adjacent streams[21,22,23,24]

Riparian vegetation should:

- Include a variety of plant species and ages. Land managers and agency personnel should recognize that differing climate, soils, and water regimens within the basin precludes all streams from having the same vegetative potential.
- Include plants that have root masses capable of withstanding high streamflows
- Provide adequate cover to protect the streambank and dissipate energy during high flows
- Include sufficient ground cover to filter out excess sediment or nutrients in overland flows
- Provide shade, where allowed by site capability

Riparian vegetation required by the Area Rules is based on site capability and includes: visible ongoing renewal of riparian vegetation, vigorous growth, and the maintenance of a majority of each year's new growth of woody vegetation (trees and shrubs). Noxious weeds are undesirable as they generally provide: less shade, filtering capacity, and stabilizing root mass than the plants they replace. Native vegetation is preferred where practical, due to its integral role within the ecosystem.

Stable Streambanks

A stream is considered stable if its banks maintain their integrity during a 25-year storm event. Channel morphology is key to streambank stability[25,26].

Channel morphology refers to the shape and physical characteristics of a stream. These include: how much the stream meanders ("sinuosity"), the slope of the streambanks, how deeply cut ("incised") the stream is, etc. Morphology is influenced by natural features such as geology and climate and by human activities.

Vegetation and structure (rocks and large woody debris) are key to maintaining bank stability by reducing flow velocities and protecting streambanks from excessive erosion.

As riparian vegetation matures, channels of low gradient streams are expected to narrow and deepen (known as a 'low width to depth ratio'). These stream channels will have less water surface area exposed to solar radiation (thereby moderating heating rates during summer) and will be more connected to their floodplain. Better floodplain connectivity has the added benefit of increasing storage during periods of high streamflow, reducing velocities during periods of high streamflow, and increasing releases of water later in the year. Streams with a low width to depth ratio will also meander more, which will reduce flow velocities and reduce the damage from flooding.

Streambanks naturally change in form or location over time; some bank instability usually occurs in undisturbed streams. Excessively unstable streambanks can contribute to:

- Sediment in the stream channel caused by slumps and surface erosion
- Fine sediment in the water
- Wider channels, which increases exposure of water to solar radiation
- Decreasing stream depth and alteration of fish habitat

Management options that may contribute to healthy riparian areas include:

1) Proper management of upland vegetation.
2) Use of herding and/or fencing to better control livestock access to riparian areas.
3) Off-stream watering areas for livestock.
4) Early-season flood irrigation to recharge groundwater and sub-surface water storage that help augment late season stream flows.
5) Control of noxious weeds.
6) Timing of livestock grazing to allow recovery of riparian vegetation
7) Planting of willows and other riparian shrubs.
8) Maintain a vegetative buffer along creeks.
9) Proper design, location, installation and maintenance of roads, culverts, bridges, stream crossings and upstream storage systems.
10) Leave large, woody debris in streams if possible.
11) Proper use of grade control structures.

2. Healthy, Productive Uplands

Approximately 40 percent of the uplands in the Management Area are privately owned[27]. The Management Area receives little precipitation and experiences prolonged droughts. Upland sites in good condition may naturally include sparsely vegetated areas.

With a protective cover of grass, shrubs or trees consistent with site capability, uplands capture, store and safely release precipitation thereby reducing the potential of excessive soil erosion or pollution in spring and augmenting the volume of late season stream flows[28].

Indicators of healthy uplands include:

- Healthy riparian areas
- Recruitment of beneficial plant species

- Ground cover to aid in infiltration of water and to limit runoff of nutrients and sediment
- Lack of noxious weeds

Proper management of upland vegetation considers physical and biological conditions of the management area, and controls soil erosion and minimizes transport of soil and nutrients to the stream. Upland management also considers wildlife habitat, livestock production, and fish protection.

Factors to evaluate upland area condition may include:
- Plant species composition to measure plant health and diversity
- Ground cover (live plants, standing plant litter, or ground litter) as a measure of potential erosion. Bare areas are a natural condition in many places.
- Evidence of overland flow (e.g. rills and gullies))
- Site productivity (domestic livestock and wildlife carrying capacity)
- Riparian area health and condition

To limit erosion and augment late season stream flows, upland management should consider the following:
- Minimize bare or exposed soil. Based on site capability, soil surface should be occupied by herbaceous vegetation, shrubs, and/or trees.
- Presence of soil organic matter (litter and biotic crust) and rock
- In forested areas, optimize tree spacing to best utilize tree productivity and snow storage. Dense stands of trees catch too much snow on the branches and lose the precipitation to sublimation and limit storage on the surface. Stands that are too open lose forest productivity and do not provide enough shading to preserve snow pack late into the spring. Proper tree stand density is site-specific.
- Healthy stands of perennial grasses are usually better at filtering sediments and limiting erosion than stands of annual grasses.

Management options that may contribute to healthy uplands include:
1) Thinning of overstocked stands of trees, including juniper.
2) Controlled burning.
3) Seeding of perennial grass plants.
4) Livestock grazing designed to encourage the incorporation of organic matter into the soil.
5) Control of noxious weeds.
6) Well-designed off-stream water aimed at improving grazing distribution of livestock.

3. Properly Managed Croplands

Diversion of water from a water body to be applied on land to grow crops is a recognized beneficial use of water. Irrigation water use is regulated by the WRD in the form of water rights, which specify the rate and amount of water that can be applied to a particular parcel of land. Water rights are not addressed in this Area plan; they are under the jurisdiction of the WRD (refer to WRD Rules OAR 690-300-0010(26) for more details).

Irrigation in the Management Area is done by flooding, sprinkler, or drip application. Water usually is diverted from a surface source (stream or pond) but may also be from groundwater sources. Irrigation water is often used more than once as it returns to the stream and is available for instream uses or by other irrigators.
This Area Plan addresses irrigation activities of individuals. Activities of irrigation districts are outside the scope of ODA's Agricultural Water Quality Management Area Program.

Characteristics of an irrigation system that has minimal effect on water quality include:

- Delivery of water efficiently to the land within legal water rights
- Minimal overland return flows that do not carry sediment, farm chemicals, or excess nutrients to a stream
- Scheduling of water application appropriate to the site including consideration of soil conditions, crop needs, climate and topography
- Applied nutrients do not leach to groundwater in unacceptable amounts.

Management options for croplands that may protect water quality may include:

1) Cropping
   - Properly place, design, and maintain roads, culverts, bridges, and crossings
   - Use conservation tillage: reduced tillage, direct seeding, subsoiling, and chemical fallow
   - Plant annual and perennial cover crops
   - Farm on the contour: strip cropping, divided slopes, terraces, contour tillage
   - Select crops that hold soil in place and enhance a crop rotation
   - Create and maintain sediment basins and vegetative buffer strips: riparian buffers, filter strips, grassed waterways, field borders, contour buffer strips, interception ditches
   - Control weeds
2) Irrigation
   - Schedule irrigation based on crop needs, soil type, weather, topography, and infiltration rates
   - Improve irrigation efficiency
   - Select, locate, maintain, and operate diversions to minimize effects on water quality
   - Minimize return flows through the use of cover crops, straw mulch, and grass filter strips
   - Install backflow devices ("check valves")
   - Grade and slope property to retain runoff whenever possible
   - Manage vegetation: burning, chemical, clipping, critical area planting
   - Stabilize ditch banks (structural and bioengineering)
   - Install outfall protection to reduce erosion at culverts
   - Size ditches appropriately to handle maximum flows
3) Crop Nutrients and Farm Chemicals
   - Apply nutrients based on plant needs through water, soil, and tissue testing
   - Use Integrated Pest Management

4. Properly Managed Livestock

Ranches of various sizes, including small noncommercial operations, should be able to support healthy livestock. Careful management of areas used for grazing, feeding and handling is useful to the success of livestock operations, and these areas have the potential to affect water quality.

Livestock management can be done in a manner that limits soil erosion and minimizes the delivery of sediment and animal wastes from drylots and pastures to nearby streams or irrigation conveyances. A proper grazing management program promotes and maintains adequate vegetative cover for protection of watershed health.

Management options for livestock that may protect water quality include:

1) Managed grazing: livestock distribution; grazing intensity, duration, frequency, and season of use

2) Maintain riparian vegetation along streams and filter strips along canals and ditches
3) Use of fencing: temporary, cross, and/or riparian
4) Manage livestock watering
5) Manage livestock wastes properly
6) Manage runoff from irrigated pastures
7) Harrow irrigated pastures if needed
8) Use or compost organic wastes

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5: STRATEGIES TO ACHIEVE GOAL AND OBJECTIVES THROUGH VOLUNTARY MEANS

To the greatest degree possible, prevention and control of agricultural pollution is encouraged in a cooperative spirit through the voluntary efforts of landowners, aided by information and technical and financial assistance from local, state, and federal agencies, and others.

Education is the key to the success of this Area Plan. The groups and agencies mentioned in Section 4 work together to provide landowners in the Management Area and the interested public with information about the goals and objectives of the Area Plan and requirements of the Area Rules.

The following strategies are used at the local level by the appropriate SWCD, with adequate funding and staff, through workplans and Memoranda of Agreement with ODA, in cooperation with landowners, other agencies, and organizations.

1. Conservation

Maintain or improve the quality of water in the Management Area through planning and implementation of technically sound and economically feasible conservation strategies (see Section 4) that contribute to meeting Area Plan objectives.

2. Community awareness

Create a high level of awareness and an understanding of water quality protection among the agricultural community and general public, in a manner that minimizes conflict and encourages cooperative efforts, through education and technical assistance.

a. Incorporate Area Plan implementation as a priority element in the SWCDs' Annual Work Plans and Long Range Plans, with adequate funding and staff and support from partner organizations.

b. Inform landowners of the Area Plan and Rules.

c. Showcase successful strategies and systems.

d. Recognize successful projects and strategies through appropriate media and newsletters.

e. Conduct educational programs to promote public awareness of water quality issues and their solutions.

f. Offer and provide site evaluations on any lands within the Management Area to assess conditions that may affect water quality.

g. Prioritize subwatersheds within the Management Area for targeting implementation strategies.

3. Funding

Identify funding sources to achieve Area Plan goals and objectives. Where possible, combine or build-in private-entity revenue-generating aspects of projects to extend benefits from funding sources and create sustainable jobs in the local economy.

Costs of implementing this Area Plan are difficult to assess in the absence of detailed, site-specific inventories of resource problems and quantification of nutrient and sediment loadings and other water quality issues of concern.

To implement this Area Plan, the SWCDs need support and resources for staff to conduct the following:

- Educational programs (production and presentation)
- Identification of high priority areas for implementation
- Ongoing evaluation of Area Plan progress toward achieving water quality goals
- Coordinated planning and implementation activities with other agencies, organizations, and individuals working on similar goals
- Watershed assessments
- Water quality monitoring
- Meeting management and facilitation

Landowners may need financial and technical assistance to meet Area Plan objectives and Area Rule requirements. Technical and cost-sharing assistance for installation of certain management practices may be available through current United States Department of Agriculture (USDA) conservation programs such as Environmental Quality Incentive Program (EQIP) and Continuous Conservation Reserve Program (CRP), and other programs such as the Environmental Protection Agency's nonpoint source implementation grants and the OWEB. Other agencies may also be available to provide technical assistance or financial assistance to private landowners.

6: AREA RULES

INTRODUCTION

Area Rules (OAR 603-095-3400 through 603-095-3460) complement the voluntary strategies. ODA pursues enforcement to gain compliance with the Area Rules **only** when reasonable attempts at a voluntary solution have failed.

The *Area Rules* are enforceable by ODA and are cited here for your information. The *Area Plan* is not enforceable; it provides an overall proactive strategy for meeting the Plan's water quality objectives and for complying with the Area Rules.

All landowners conducting agricultural activities on non-Federal and non-Tribal Trust lands (including timber lands) must comply with the Area Rules (OAR 603-095-3400 through 603-095-3460). '*Landowner'* includes any landowner, land occupier or operator (ORS 568.903). The landowner's responsibility is to implement measures that ensure compliance with these Area Rules. Sanctions can come into effect from ODA if a landowner is out of compliance with the Area Rules.

Effective dates of the Area Rules vary, depending on current State Law and on the ease with which compliance with these Area Rules can be attained. For example, landowners are allowed until the year 2009 to comply with the Streamside Riparian Area Management Rule because most of these changes take time and may require planning and implementation of management changes. However, landowners are encouraged to take current action in adapting their management techniques so they can control the conditions on their property.

Some Area Rules may become more specific over time, as information becomes available on land conditions and water quality.

AREA RULES

Oregon Administrative Rules 603-095-3440

(1) Landowners must comply with OAR 603-95-3440(2) through (3) within the following limitations. A landowner is responsible for only those conditions resulting from activities controlled by the landowner. A landowner is not responsible for conditions resulting from activities by landowners on other lands. A landowner is not responsible for conditions that: are natural, could not have been reasonably anticipated, or that result from unusual weather events or other exceptional circumstances.

(2) Streamside Riparian Area Management
(a) Effective January 1, 2009, agricultural management must allow establishment, growth, and active recruitment of streamside riparian vegetation, consistent with site capability, to moderate solar heating, stabilize streambanks, and filter sediment and nutrients from overland flows.
(b) Except as provided in (a), grazing, weed control, and other common agricultural activities are allowed in riparian areas.
(c) Water gaps and hardened crossings are allowed in streams that otherwise meet conditions required under (a).

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

The Streamside Riparian Area Management Rule requires activities that prevent streamside riparian vegetation from developing to cease by 2009; it does not require that adequate vegetation be present by 2009. The rule does not specify particular activities that must cease and does not require any specific activity to take place. Landowners are not responsible for wildlife browsing and grazing use.

This Rule does not require that all sediment be kept out of streams by 2009. This rule refers to the filtration of sediment caused by human activities, not sediment resulting from natural processes. Sufficient vegetation to filter out sediment also helps reduce the amount of bacteria and nutrients entering streams.

The Waste Management Rule currently is State Law (ORS 468B.025 and ORS 468B.050). ORS 468B.025 states that no person shall:

(1) (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) Violate the conditions of any waste discharge permit issued under ORS 468B or ORS 568.

ORS 468B.050 refers to situations when permits are required, such as for certain confined animal feeding operations.

This rule ensures that concentrated nutrients, pathogens associated with high animal density areas, high sediment concentrations in run-off, toxics, or other potential pollutants are not readily transported to waters of the state.

Wastes associated with livestock operations can include manure from seasonal feeding and birthing areas, gathering areas and corrals, rangelands and pasture, and any other situations not already covered by Oregon's Confined Animal Feeding Operation (CAFO) laws. Fecal coliform counts that exceed state water quality criteria indicate noncompliance with the Waste Management Rule. Livestock grazing is allowed to the extent it does not violate state water quality standards and complies with the Area Rules. Compliance with the Streamside Riparian Area Management Rule will help keep wastes from being carried into waters of the state.

Wastes may also include excess sediment discharges. Landowners who are actively discharging significant quantities of sediment may be in violation of the Waste Management Rule.

Definitions:
Wastes include manure, commercial fertilizers, soil amendments, composts, vegetative materials, or any other substances that will or may cause water pollution (OAR 603-095-0010(53)).

Waste discharge means the discharge of waste, either directly or indirectly, into waters of the state (OAR 603-095-0010(54)).

Water pollution means such alteration of the physical, chemical or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the state, which will or tends to, either by itself or in connection with any other substance, create a public nuisance or which will or tends to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof (ORS 468B.005(7)).

Waters of the State include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, marshes, inlets, canals, and all other bodies of surface or underground waters, natural or artificial, public or private (except those private waters which do not connect to natural surface or underground waters) within Oregon (from ORS 468B.005(8)).

AREA RULE ENFORCEMENT

In addition to the voluntary strategies, Area Rules (OAR 603-095-3400 through 603-095-3460) are included as an implementation strategy; ODA uses enforcement where appropriate and necessary to gain compliance with the Area Rules. Any enforcement action is pursued only when reasonable attempts at a voluntary solution have failed. ODA seeks input from the local SWCD prior to evaluating conditions for compliance or requiring a schedule of corrective practices. ODA will consult with the local SWCD regarding appeals and requests for alternate measures provided by ORS 568.912 and OAR 603-090-0040 and 0050. The following Area Rules provide for resolution of complaints.

ODA is required to make a reasonable attempt to notify the landowner that entry of property is necessary prior to entering. ODA may not enter private property to collect information without landowner consent or a search warrant, except as provided by state and federal law.

Complaints and Investigations (OAR 603-095-3460)

(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 will 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 603-095-3460(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 603-095-3460(4), "person" does not include any local, state or federal agency.

(6) Notwithstanding OAR 603-095-3460, the department may investigate at any time any complaint if the department determines that the violation alleged in the complaint may present an immediate threat to the public health or safety.
(7) If the department determines that a violation of ORS 568.900 to 568.933 or any rules adopted thereunder has occurred, the landowner may be subject to the enforcement procedures of the department outlined in OARs 603-090-0060 through 603-090-0120.

7: ROLES AND RESPONSIBILITIES

TOTAL MAXIMUM DAILY LOADS (TMDLs)

TMDLs are expected from DEQ for the Management Area by 2011 at the earliest. The Area Plan will be the implementation plan for Agriculture's Load Allocation for each TMDL parameter in the Management Area, and may be revised to address TMDL requirements.

AREA PLAN

ODA is the Designated Management Agency for controlling pollution from agricultural activities on agricultural, rural, and forestry lands in the Management Area. ODA is authorized to develop and carry out a water quality management plan for any agricultural or rural lands, where a water quality management plan is required by state or federal law.

The original Area Plan and Rules were adopted in June 2004. The LAC reconvenes biennially to review the Area Plan and Rules and amend them as necessary. Any future amendments will include the public participation process outlined in Oregon Law. The public is encouraged to participate in the development and implementation of the Area Plan and Rules. All LAC meetings are open to the public, announced in the *Central Oregonian*, Bend Bulletin, and closely follow Oregon's Public Meeting Laws.

The Crook County SWCD is the Local Management Agency (LMA) for implementation of the Area Plan. It assists with administration, outreach, and providing technical assistance to landowners. The Crook County SWCD coordinates with adjacent SWCDs to assist landowners in other counties.

The day-to-day implementation of this Plan is accomplished through agreements between local SWCDs and ODA. Under such agreements, the SWCDs act as LMAs within their respective jurisdictions. Implementation priorities are established on a periodic basis through annual work plans developed jointly by the SWCDs and ODA with input from partner agencies.

As resources allow, SWCD, NRCS, Oregon State University Cooperative Extension, and other agency staff can assist landowners in evaluating effective practices for meeting water quality objectives. These personnel can also design and assist with implementation of practices, and assist in identifying any sources of cost-sharing funds for the construction and/or use of some of these practices.

ODA and the SWCDs provide presentations to interested groups on an ongoing basis. They also meet individually with landowners to explain the Area Plan and Rules and to provide site-specific educational reviews of land conditions relative to water quality.

Any actions related to determination of noncompliance with Area Rules or enforcement are taken up directly by ODA, as outlined in OARs 603-090-0000 through 603-090-0120.

8: MONITORING AND EVALUATION

A monitoring program is being developed by ODA and its partners and implemented as funding becomes available, to:

- Track Area Plan implementation and compliance with the Area Rules
- Evaluate Area Plan effectiveness (improvements in water quality and land conditions)

The Crooked River Watershed Council is developing a water quality monitoring program.

Monitoring is encouraged for landowners who want to document improvements in their riparian vegetation and stream conditions. Those wishing to do so should contact their local SWCD or watershed council. Photomonitoring (keeping a record with photographs) is a simple and effective method.

For monitoring water quality, the Oregon Plan for Salmon and Watersheds' *Water Quality Monitoring Technical Guide Book* (July 1999) is the preferred reference manual; however, other protocols also can be obtained from the local SWCDs or watershed councils. Specific monitoring protocols depend on the condition being assessed.

AREA PLAN IMPLEMENTATION

The local SWCDs and ODA are responsible for implementing the Area Plan. The SWCDs, as Local Management Agencies, maintain agreements with ODA that outline their responsibilities for providing educational outreach and technical assistance.

The SWCDs, with adequate resources:

- Participate in developing and evaluating outreach and education programs designed to provide public awareness and understanding of water quality issues
- Review reports, projects, demonstrations, and tours used to showcase successful management practices and systems
- Evaluate the adequacy of technical and financial assistance sources available to the agricultural community to implement recommended best management practices, monitoring, and education.

AREA PLAN PROGRESS AND SUCCESS

The Crook County SWCD, ODA, and the LAC are responsible for determining whether the goals will be met within the timeframes identified in the Area Plan. Progress and success of implementation efforts will be assessed through compliance with Area Rules and State standards and the measurement of water quality improvement over time. Monitoring of land conditions related to water quality is the responsibility of ODA.

ATTACHMENT A: Acronyms and Abbreviations

Area Plan – Crooked River Subbasin Agricultural Water Quality Management Area Plan

Area Rules - Oregon Administrative Rules 603-095-3400 through 603-095-3460

BLM – Bureau of Land Management

CWA – Clean Water Act

DEQ - Oregon Department of Environmental Quality

DMA - Designated Management Agency

EPA – Environmental Protection Agency

LAC – Crooked River Subbasin Local Advisory Committee

LMA – Local Management Agency

Management Area – Crooked River Subbasin Agricultural Water Quality Management Area

NRCS - USDA Natural Resources Conservation Service

OAR - Oregon Administrative Rules

ODA - Oregon Department of Agriculture

ORS - Oregon Revised Statutes

PFC – Proper Functioning Condition

SWCD - Soil and Water Conservation District

TMDL - Total Maximum Daily Load

USDA - United States Department of Agriculture

WRD – Water Resource District

When a bill is signed into law by the Oregon Governor, the Legislative Committee codifies the bill into Oregon Revised Statutes (ORS). Often, state agencies cannot directly implement ORSs because the statutes do not provide sufficient guidance for implementation. Instead, agencies must develop and adopt OARs to clarify how the agency will administer the statute. For example, the 1993 State Legislature approved Senate Bill 1010. It was codified into ORS 568.900-568.933. The ODA, working with an advisory committee of interested parties, then developed and adopted OAR 603-090 to outline the policies and procedures for implementing that ORS.

ATTACHMENT B: Legislative Drivers for the Development of Oregon's Agricultural Water Quality Management Area Plans

FEDERAL CLEAN WATER ACT (CWA) OF 1972

The **CWA** required states to protect the quality of their waters, including rivers, streams, and lakes by 1983. Each state must determine the quality of its waters, identify those with poor quality, and address water quality problems. In Oregon, the DEQ is the lead agency responsible for implementing the Clean Water Act.

To determine water quality, states designate beneficial uses of the water that must be protected, select water quality parameters most directly related to those beneficial uses, and set standards for those parameters to ensure that the beneficial uses are being met.

Oregon's **beneficial uses** are defined in the OARs for each basin. Commonly designated beneficial uses include drinking water, cold-water fisheries, industrial water supply, recreation, agricultural uses, and other activities. When there are multiple beneficial uses in a river or stream, federal law requires DEQ to protect the most sensitive, in terms of its susceptibility to pollution, which would result in water of a quality sufficient to support all of the beneficial uses.

States must select **parameters** that define and contribute to water quality and are related to the beneficial uses. DEQ sets standards for water quality parameters such as bacteria, pH, turbidity, dissolved oxygen, temperature, total dissolved gas, certain toxic and carcinogenic compounds, and aquatic weeds or algae. Also, each state must **establish standards** for each parameter to determine whether or not the parameter is, or is not, contributing to limitations in the quality of the water body. Finally, the state must monitor water quality and review available data and information to determine if the standards are being met.

Section 303(d) of the CWA requires each state to develop a list of Water Quality Limited waterbodies that do not meet standards and to submit an updated list of noncompliant waterbodies to the federal Environmental Protection Agency (EPA) every two years. The most recent **303(d)** lists were completed in 2006. The list is designed only to identify water quality concerns and not their causes. DEQ follows federal criteria, state water quality standards and scientific protocols to assess water quality and determine which waterbodies should be on the 303(d) list. Oregon, like most states, has information on many, but not all, of its waterbodies.

Section 303(d) also requires that each state establish **Total Maximum Daily Loads (TMDLs)** for any Water Quality Limited waterbodies. TMDLs set maximum limits on the amount of pollutants allowed to enter state waters and still meet water quality standards. When establishing TMDLs, DEQ reviews existing data and collects additional data as needed to determine the location, amount, and source of pollutants. A TMDL consists of Load Allocations, Waste Load Allocations, and a strategy that will ensure that waterbodies will attain and maintain water quality standards. In Oregon, DEQ develops TMDLs on a watershed basis, not just for specific waterbodies.

Load Allocations are limits assigned by DEQ to the different entities that contribute to the water quality problem, including natural, human, and future nonpoint pollutant sources. Load Allocations may include such things as a required reduction in sediment expressed in tons/acre/year or shade targets that must be met to reduce the rate of solar heating of water. Land use types such as agriculture, private forest lands, Federal lands, and urban areas in each TMDL area will be assigned a Load Allocation as appropriate. Wasteload Allocations are limits assigned to point sources of pollution.

The strategy for achieving Load Allocations consists of area **Water Quality Management Plans** developed by the Designated Management Agencies (DMAs) responsible for the various land use types (e.g. Oregon Department of Agriculture (ODA) for agriculture). Each DMA will develop a pollution control plan and programs designed to meet the load allocations.

DEQ includes the Management Plans in the TMDL package, which it then submits to EPA for approval. DEQ will continue to evaluate waterbodies to ensure that management plans are being implemented, are adequate, and water quality standards are achieved.

OREGON REVISED STATUTE CHAPTER 468B

ORS 468B.010 to 468B.050 lays out a broad framework under which **water pollution is defined and controlled** to protect beneficial uses of water. State water quality standards (e.g. temperature criteria or *E. coli* bacteria) are set at levels sufficient to protect beneficial uses.

A key portion of the statute, ORS 468B.025(1), states "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."

DEQ is responsible for enforcement of ORS Chapter 468B, except as provided below under ORS 561.191 for agricultural practices that affect water quality.

ORS 568.900 – 568.933 (Agricultural Water Quality Management Act)

Due to increased awareness of the requirements of the Federal Clean Water Act, the State of Oregon realized that it would need to be more assertive in developing TMDLs and associated Water Quality Management Plans. In 1993, the State Legislature passed the Agricultural Water Quality Management Act, which was codified into ORS 568.900-568.933. Oregon Administrative Rules Chapter 603 Division 090 was subsequently adopted to clarify the requirements of the law and ODA's authority under the Act. ORS 568.900-.933 gave ODA the authority to develop **agricultural water quality management area plans and rules** where required by Federal or State law. The statute and the administrative rules outline the process for the development and implementation of agricultural water quality management area plans to help prevent and control water pollution resulting from agricultural activities and soil erosion. The process includes the formation of a Local Advisory Committee that consists primarily of landowners in the affected area to assist ODA in the development of the Area Plan and Rules.

ORS 561.191 (SENATE BILL 502)

In 1995, the Oregon legislature recognized potential confusing authorities that belonged to both ODA and DEQ regarding the enforcement of water quality statutes. To clarify authorities granted to ODA in the Agricultural Water Quality Management Act, the state legislature passed Senate Bill 502, codified at ORS 561.191. This statute states that ODA shall develop and implement any program or rules that directly regulate farming practices that are for the purpose of protecting water quality. A 1996 opinion from the Oregon Attorney General's office states that ODA has the statutory responsibility to regulate agriculturally related water pollution. That same opinion also recognized the need to define that authority by developing water quality plans and rules that specifically addressed agricultural practices and land conditions and achieve the standards adopted by the Environmental Quality Commission.

ATTACHMENT C: Noxious Weed Lists

1. CROOK COUNTY

LIST A

These weeds occur in small enough infestations to make eradication/containment possible, or are not known to occur but their presence in neighboring counties make future occurrence in the county seem imminent. List A also includes weeds that are actively managed by neighboring counties due to agricultural concerns (e.g. Jefferson County produces carrots, and wild carrot poses a threat to agricultural carrot crops). List A weeds are high priority sites for treatment.

Management Goal: Eradicate or contain populations; prevent List A weeds from becoming more abundant and moving onto List B.

Aegilops cylindricaa	jointed goatgrass
Carduus nutans	musk thistle
Centaurea solstitialis	yellow starthistle
C. virgata	squarrose knapweed
Chondrilla juncea	rush skeletonweed
Daucus carota	wild carrot
Euphorbia esula	leafy spurge*
Lepidium latifolium	perennial pepperweed
Linaria dalmatica	Dalmatian toadflax
Lythrum salicaria	purple loosestrife
Onopordum acanthium	Scotch thistle
Peganum harmala	African rue
Salvia aethiopis	Mediterranean sage
Senecio jacobaea	tansy ragwort

* All areas except Mill Creek drainage and within 50 feet of the high water mark on the Crooked River

LIST B

These weeds are abundant in the county and of great concern because they cause economic and ecological losses. Eradication of List B weeds in the county may not be realistic; however, they are still high priority species for strategic treatment and control to prevent further spread.

Management Goal: Control List B weeds to prevent their spread into new areas. Management strategies should focus on outlying populations to protect native ecosystems, as well as high public use areas.

Cardaria spp.	Whitetop
Centaurea diffusa	diffuse knapweed
C. maculosa	spotted knapweed
C. repens	Russian knapweed
Cirsium arvense	Canada thistle
Conium maculatum	poison hemlock
Cynoglossum officinale	common houndstongue
Cytisus scoparius	Scotch broom
Hypericum perforatum	St. Johnswort
Iris pseudacorus	yellow flag iris
Senecio vulgaris	common groundsel
Sonchus asper	spiny sowthistle

Taeniatherum caput-medusae	medusahead rye
Tribulus terrestris	puncturevine

LIST C

These weeds are abundant. They are not high priority species to control. However, it may be desirable to treat localized populations to prevent their spread into new areas, and/or to protect from economic and ecological losses.

Management Goal: Treat List C species as "incidental" and control on a case-by-case basis.

Cicuta maculata	western waterhemlock
Cirsium vulgare	bull thistle
Convolvulus arvensis	field bindweed
Dipsacus fullonum	common teasel
Kochia scoparia	kochia
Melilotus officinalis	yellow sweetclover
Ranunculus testiculatus	bur buttercup
Salsola iberica (= S. kali)	Russian thistle
Verbascum thapsis	common mullein

2. MANAGEMENT AREA PRIORITY WEEDS

The Management Area contains portions of 6 counties, in addition to almost all of Crook County. The following weeds are found on the lists of at least six of the seven counties:

Acropitlon repens	Russian knapweed
Cardaria spp.	whitetop
Centaurea diffusa	diffuse knapweed
Centaurea maculosa	spotted knapweed
Centaurea solstitialis	yellow starthistle
Centaurea virgata	squarrose knapweed
Chondrilla juncea	rush skeletonweed
Cirsium arvense	Canada thistle
Convolvulus arvensis	field bindweed/morning glory
Euphorbia esula	leafy spurge
Hypericum perforatum	St. Johnswort/Klamath weed
Kochia scoparia	kochia
Lepidium latifolium	perennial pepperweed
Linaria dalmatica	Dalmatian toadflax
Lythrum salicaria	purple loosestrife
Onopordum acanthium	Scotch thistle
Salvia aethiopis	Mediterranean sage
Senecio jacobaea	tansy ragwort
Taeniatherum caput-medusae	medusahead rye
Tribulus terrestris	puncturevine

ATTACHMENT D: Oregon Administrative Rules 603-090

DEPARTMENT OF AGRICULTURE
AGRICULTURAL WATER QUALITY MANAGEMENT PROGRAM

603-090-0000: Preamble

(1) ORS 568.900 to 568.933 authorizes the Oregon Department of Agriculture to develop and carry out an agricultural water quality management area plan for agricultural and rural lands where a water quality management plan is required by state or federal law. In executing this responsibility, the department develops, adopts, and periodically modifies programs to effectuate
agricultural water quality management area plans in the applicable geographic areas.
(2) These administrative rules establish policies, guidelines, and specific requirements for the development and content of agricultural water quality management area plans and rules, requirements of agricultural water quality management area plans and rules for applicable geographic areas, the process of landowner appeal of specific required actions, and enforcement procedures to be followed by the department.
(3) Agricultural water quality management area plans are plans that comprehensively outline measures that will be taken to prevent and control water pollution from agricultural activities and soil erosion on agricultural and rural lands located in a management area which requires such a plan and for which boundaries have been established by the department.
(4) Agricultural water quality management area rules are adopted by the department to implement an agricultural water quality management area plan. Area rules are the only enforceable aspect of an agricultural water quality management area plan.
(5) It is the policy of the department that:
(a) Cooperation between private and public entities be encouraged during the development and implementation of water quality management area plans;
(b) To the full extent possible, pollution prevention activities be the focus of water quality management area plans;
(c) Voluntary adoption of land management activities be encouraged through education and demonstration programs to achieve the goals and objectives of water quality management area plans;
(d) Enforceable mechanisms be available to address water pollution problems where voluntary compliance is not achieved;
(e) Enforcement action be pursued only when reasonable attempts at voluntary solutions have failed; and
(f) Measures required of individual landowners under agricultural water quality management area rules provide as much flexibility as reasonably possible.

603-090-0010: Definitions

Unless other required by the context, as used in this Division:
(1) "Agency of this state" has the meaning given in ORS 568.210(1).
(2) "Area Plan" or "Agricultural Water Quality Management Area Plan" means a plan for the prevention and control of water pollution from agricultural activities and soil erosion in a management area the boundaries of which have been designated under ORS 568.909.
(3) “Area Rules” or “Agricultural Water Quality Management Area Rules” are administrative rules adopted by the state Department of Agriculture, in consultation with the state Board of Agriculture, for the implementation of the Area Plan adopted under ORS 568.909.
(4) "Board" means the state Board of Agriculture.
(5) "Department" means the state Department of Agriculture.
(6) "Director" means the director of the state Department of Agriculture.
(7) "Individual Water Quality Management Plan" means a plan for the prevention or control of water pollution for an individual landowner.
(8) "Landowner" includes any landowner, land occupier or operator as defined in ORS 568.903.
(9) "Local Management Agency" means any agency of this state, including but not limited to a soil and water conservation district, which has been designated by the department to undertake activities within a management area whose boundaries have been designated under ORS 568.909.
(10) "Local Management Area Advisory Committee" means a committee established by the department under OAR 603-090-0020.

(11) "Operator" has the meaning given in ORS 568.900(2).
(12) "Pollution" or "water pollution" has the meaning given in ORS 468B.005(3).
(13) "Water" or "the waters of the state" has the meaning given in ORS 468B.005(8).

603-090-0020: Local Water Quality Management Area Advisory Committee

(1) The department shall establish a local water quality management area advisory committee for each water quality management area established under these rules. The local water quality management area advisory committee shall represent a balance of affected persons. The local water quality management area advisory committee must provide an opportunity for a high level of citizen involvement in the development and implementation of the agricultural water quality management area plan and rules. The members of each local water quality management area advisory committee shall be appointed by the director in consultation with the board. The director and board shall consider the recommendations, if any, of the designated local management agency when making advisory committee appointments.

(2) A local water quality management area advisory committee shall consist of not more than twelve members, unless otherwise determined by the director in consultation with the board.

(3) A local water quality management area advisory committee shall be composed primarily of landowners in the affected local agricultural water quality management area. Membership may include, but is not limited to:
(a) State Board of Agriculture representatives;
(b) Persons serving on local soil and water conservation districts;
(c) Private landowners;
(d) Representatives of local, state and federal boards, commissions and agencies;
(e) Members of Indian tribes;
(f) Members of the public;
(g) Persons associated with industry;
(h) Members of academic, scientific and professional communities;
(i) Public and special interest groups.

(4) The local water quality management area advisory committee's responsibilities shall include but are not limited to:
(a) Participation in the development and ongoing modifications of the agricultural water quality management area plan and rules;
(b) Recommendation of strategies necessary to achieve water quality goals and objectives outlined in the agricultural water quality management area plan;
(c) Biennial review of the progress of implementation of the water quality management area plan and rules, including enforcement actions taken, and requests for alternate measures that have been granted or denied;
(d) Submittal of biennial, written reports to the Board and the director, including a summary of meetings held, advisory committee members present, actions taken, and progress and impediments toward implementation of the agricultural water quality management area plan; and recommendations for modifications that may be necessary to achieve the purpose of the agricultural water quality management area plan as provided in OAR 603-090-0030.
(5) The Local Advisory Committee may reconvene as frequently as necessary to carry out the duties described above in OAR 603-090-0020(4).

603-090-0030 : Requirements of an Agricultural Water Quality Management Area Plan

(1) Agricultural water quality management area plans must describe a program to achieve the water quality goals and standards necessary to protect designated beneficial uses related to water quality, as required by state and federal law. An area plan shall include but not be limited to a description of the geographical area and physical setting to which the area plan applies, a listing of water quality issues of concern, a listing of current designated beneficial uses that are being adversely affected, a statement that the goal of the area plan is to prevent and control water pollution from agricultural activities and soil erosion and to achieve applicable water quality standards, a statement of the water quality objectives of the area plan, a description of the pollution prevention and control measures deemed necessary by the department to achieve the goal, a schedule for implementation of the necessary measures that is adequate to meet applicable dates established by law, guidelines for public participation, and a strategy for ensuring that the necessary measures are implemented.
(2) Agricultural water quality management area rules are the only enforceable aspect of an area plan. Area rules must be sufficient to assure that landowners in compliance with the area rules will prevent and control water pollution from agricultural activities and soil erosion.

603-090-0040 : Specific Action Requirements -- Appeals

(1) Pursuant to ORS 568.912, a landowner subject to agricultural water quality management area rules may be required to undertake certain specific actions. The required specific actions may but need not be incorporated into an individual water quality management plan. A landowner may appeal a specific action requirement by filing a formal request for alternate measures as provided in OAR 603-090-0050.
(2) Prior to filing a formal request for alternate measures, a landowner may informally consult with the department regarding the specific actions required to comply with the water quality management area rules. Such consultation, however, shall not extend the time periods required for filing a formal request.
(3) A general requirement for an individual water quality management plan may not be appealed under this provision.

603-090-0050: Request for Alternate Measures -- Filing, Content, and Approval

(1) A request for alternate measures shall be made in writing and filed with the director. The request may be filed at anytime.
(2) A request shall include a detailed description of proposed alternate measures and sufficient information to determine whether the request satisfies the requirements of section (3) of this rule.
(3) A request for alternate measures shall be approved if the director, following consultation with other agencies as appropriate, finds that the alternate measures will provide a level of water quality protection equivalent to that which is provided by the specific actions required to comply with the water quality management area rules.
(4) The director shall determine whether to allow a request for alternate measures within 60 days after the request is received unless the landowner agrees to extend the period or the director makes a determination that a longer period of time is required to obtain sufficient information to evaluate the request. If the request is filed while an enforcement action is pending, this 60 day period shall not begin to run until the enforcement action has been concluded. The enforcement action shall not be considered concluded if an appeal is pending or civil penalties remain unpaid.
(5) The director's decision to approve or deny a request for alternate measures shall be made in writing and shall be an order in other than a contested case for purposes of judicial review.

Enforcement Procedures

603-090-0060: Definitions

Unless otherwise required by the context, as used in this Division:
(1) "Compliance" means meeting the requirements of ORS 568.900 to 568.933 or any of the department's rules or orders pursuant thereto.
(2) "Flagrant Violation" means any violation where the respondent had actual knowledge of the law and knowingly committed the violation.
(3) "Formal Enforcement Action" means any order of the director or the director's designee which is issued to a respondent in connection with a violation and requires the respondent to cease the violation, refrain from further violations, pay a civil penalty, or take other actions with respect to the violation. Formal enforcement actions include, but are not limited to, notices of
noncompliance, civil penalty assessment, compliance schedules and stipulated or consent orders.
(4) "Intentional" means conduct by a person with a conscious objective to cause the result of the conduct.
(5) "Negligence" or "Negligent" means failure to take reasonable care to avoid a foreseeable risk of committing a violation.
(6) "Order" has the meaning given in ORS 183.310(5).
(7) "Past occurrence of violations" means any violation for which a notice of noncompliance or assessment of civil penalty was issued within the preceding ten years. It does not include a violation if the notice is the subject of a pending appeal or if the notice has been withdrawn or successfully appealed.
(8) "Person" includes individuals, corporations, associations, firms, joint stock companies, public and municipal corporations, political subdivisions of the state and any agencies thereof, and the federal government and any agency thereof.
(9) "Previous notice of the same or similar violation" means a notice of noncompliance or assessment of civil penalties for the same or a similar type of violation that was issued within the preceding five years. It includes a notice for the same or a similar type of violation which is the subject of a pending appeal. It does not include a notice that has been withdrawn or successfully appealed.
(10) "Reckless" means conduct by a person who is aware of and consciously disregards a substantial and unjustifiable risk that the result will occur or that the circumstance exists. The risk must be of such a nature and

degree that disregard thereof constitutes a gross deviation from the standard of care a reasonable person would observe in that situation.
(11) "Repeat Violation" means the recurrence of the same type of violation as a violation for which a notice of noncompliance or assessment of civil penalty was issued within the preceding ten years. It does not include a violation if the previous notice is the subject of a pending appeal or if the notice has been withdrawn or successfully appealed.
(12) "Respondent" means the person to whom a formal enforcement action is directed.
(13) "Rule" has the meaning given in ORS 183.310(8).
(14) "Violation" means failure to comply with any rule or order made by the department pursuant to ORS 568.900 to 568.933 and includes both acts and omissions.
(15) "Wastes" has the meaning given in ORS 468B.005(7).

603-090-0070: Consolidation of Enforcement Proceedings
Notwithstanding that each and every violation is a separate and distinct offense, and in cases of continuing violations, that each day's continuance is a separate and distinct violation unless otherwise determined by the department, proceedings for the assessment of multiple civil penalties for multiple violations against a landowner may be consolidated into a single proceeding.

603-090-0080: Enforcement Actions
(1) A Notice of Noncompliance:
(a) Shall inform the landowner of the violation, including a reference to a particular statute, administrative rule(s) or order involved, the location of the violation when appropriate, and the consequences of the violation or future violations;
(b) Shall direct the subject landowner to perform those actions necessary to comply with the water quality management area rules and orders pursuant to the area rules;
(c) Shall specify a reasonable period of time by which compliance is to be achieved not to exceed 30 business days after the date of the notice, or if the violation requires more than 30 days to correct, a period of time contained in a plan of correction acceptable to the department;
(d) Shall be issued by the director or the director's designee;
(e) Shall be in writing and shall be served personally or by registered or certified mail;
(f) Shall in all cases also be mailed or delivered to the legal owner of the property;
(g) Shall be an order other than a contested case for purposes of judicial review.
(2) A plan of Correction:
(a) Shall include a statement of the actions that must be taken by the landowner to eliminate the violation and shall include a schedule stating the time by which each of the actions is required to be accomplished to achieve compliance;
(b) May include requirements for the landowner to report the completion of specific actions;
(c) Shall be in writing and shall be sent to the landowner by registered or certified mail or served personally;
(d) Shall be an order other than a contested case for the purposes of judicial review.
(3) The department shall make a reasonable attempt to consult with the subject landowner in the development of a plan of correction.
(4) Failure to perform any of the requirements of a plan of correction may be considered by the department to be a failure to correct the violation within the period of time set for correction by the department.
(5) A Notice of Civil Penalty Assessment:
(a) Shall be issued by the director or the director's designee;
(b) Shall be issued in a manner consistent with the provisions of ORS 183.415, ORS 568.900 to 568.933, and OAR Chapter 137;
(c) Shall be in writing and shall be served personally or by registered or certified mail;
(d) Shall include but not be limited to:
(A) A reference to the particular statute, administrative rules or order involved;
(B) A short or plain statement of the matters asserted or charged including a reference to the location of the violation when appropriate;
(C) A statement of the amount of the penalty and how it was calculated;
(D) A statement of the person's right to request a hearing within ten business days from the date of receipt of the notice and an explanation of how a hearing may be requested;
(E) A statement that the notice becomes a final order unless the person on whom the civil penalty is assessed makes

a written request for a hearing within ten business days from the date of receipt of the notice.

603-090-0090: Hearing Procedures

All formal hearings requested by the respondent concerning a civil penalty assessment shall be conducted in accordance with applicable contested case procedures as outlined in ORS 183.310 to 183.550, and OAR Chapter 137.

603-090-0100: Entry of Order, Appeal Rights, and Payment of Civil Penalties

(1) If a person having received a notice of civil penalty assessment fails to request a hearing as specified in OAR 603-090-0090, or if after the hearing the person is found to be in violation of the provisions of these rules, an order may be entered by the department assessing a civil penalty.
(2) The order shall be signed by the director or the director's designee.
(3) If the order is not appealed, any penalty is due and payable ten business days after the order imposing the civil penalty becomes final by operation of law or on appeal.
(4) When an order assessing civil penalty becomes final by operation of law or on appeal and the amount of the penalty is not paid within 10 days after the order becomes final, the order may be recorded with the county clerk in any county of this state as provided by ORS 183.090(6) and proceedings to enforce the order may be initiated in accordance with ORS 183.090(12).

603-090-0110: Civil Penalty Assessment

(1) In addition to any other penalty provided by law, the department may assess a civil penalty against a landowner for failing to comply with the requirements of agricultural water quality management area rules adopted under ORS 568.900 to 568.933 including orders to implement the area rules. The amount of civil penalty shall be determined using the two matrices contained in OAR 603-090-0120 in conjunction with the formula contained in OAR 603-090-0120(4). The amount of the initial civil penalty may not exceed $2,500 and any subsequent civil penalties for a repeat occurrence may not exceed $10,000 per violation.
(2) Prior to assessment of a civil penalty for a violation, the department shall provide a notice of noncompliance to the landowner. No advance notice or period to achieve compliance prior to assessment of a civil penalty shall be required under section (1) of this rule and the department may issue a notice of civil penalty assessment if:
(a) The violation is intentional; or
(b) The landowner has received a previous notice of the same or similar violation.
(3) The amount of any civil penalty imposed shall be reduced by the amount of any civil penalty imposed by the Environmental Quality Commission or the Department of Environmental Quality if the latter penalties are imposed on the same person and are based on the same violation.
(4) Magnitude of Violation: The magnitude of a violation shall be categorized as follows:
(a) Category I (Major):
(A) A violation of a department order issued as part of or in connection with a formal enforcement action;
(B) Failure to provide access to premises or records when required by statute, rule or order;
(C) Any direct discharge of wastes that enters the waters of the state, either without a waste discharge permit, or from a point not authorized by a waste discharge permit;
(D) Submitting records, reports or application forms that are false, misleading, or fraudulent;
(E) Failure to provide notification of a spill or upset condition that results in a nonpermitted discharge of public waters;
(b) Category II (Moderate):
(A) Failure to submit a plan or report if required by rule;
(B) Placing wastes such that the wastes are likely to enter the waters of the state by any means:
(C) Any violation of a department rule or order which is not classified elsewhere in these rules as major or minor.
(c) Category III (Minor): Failure to operate in accordance with an approved individual water quality management plan.
(5) The gravity of effect of the violation shall be determined by consideration of the individual or cumulative possibility of harm to public health or the environment caused by a violation or violations. Gravity of effect shall be classified as high, medium or low. The existence of one or more factors determined to be high level shall result in the gravity of effect considered to be of
high level. Lacking any factor determined to be of high level, the existence of one or more factors of medium level shall result in the gravity of effect to be considered to be of medium level. Lacking any factor of high or medium level shall result in the gravity being of low level:

(a) Gravity of Effect -- High Level:
(A) Significant injury to crops, wildlife or livestock; or
(B) Surface or groundwater contamination of a level that poses a significant risk of harm to public health or the environment.
(b) Gravity of Effect -- Medium Level: Surface or groundwater contamination that causes a loss of beneficial uses or a violation of applicable water quality standards, but does not pose a significant threat to human health or the environment.
(c) Gravity of Effect -- Minor Level: Water contamination not found or not found at a level in excess of applicable water quality standards.

603-090-0120: Civil Penalty Determination Procedure

In determining the amount of a civil penalty to be assessed for any violation of the requirements of agricultural water quality management area rules adopted under ORS 568.900 to 568.933, the department shall apply the following procedure:
(1) Determine the magnitude of the violation as specified in OAR 603-090-0110(4).
(2) Determine the gravity of effect pertinent to the violation as specified in OAR 603-090-0110(5).
(3) Using the magnitude of the violation and the gravity of effect identified, and depending on whether it is the first or a repeat violation, determine the base penalty (B) by reference to the appropriate matrix contained in this rule.

Civil Penalty Matrix for First Violation

Gravity of Effect Magnitude of Violation	High	Medium	Low
Category I (Major)	$1,200	$800	$400
Category II (Moderate)	$ 600	$400	$200
Category III (Minor)	$ 240	$120	$ 50

Civil Penalty Matrix for Repeat Violations

Gravity of Effect Magnitude of Violation	High	Medium	Low
Category I (Major)	$5,000	$2,400	$800
Category II (Moderate)	$1,600	$ 800	$400
Category III (Minor)	$ 400	$ 400	$100

(4) Calculate the amount of the civil penalty to be assessed utilizing the formula:

$$B + [(.1 \times B)(P + H + R)] = \text{Penalty Amount}$$

where:
(a) B = Base penalty is the primary penalty for a given violation derived from the appropriate matrix contained in OAR 603-090-0120;
(b) P = Past occurrence of violations of the requirements of water quality management area rules adopted under ORS 568.900 to 568.993. P will be weighted from 0 to 6 in the following manner:
(A) 0= no prior violation or insufficient evidence on which to base a finding;
(B) 1 = past occurrence of a Category III violation;
(C) 2 = past occurrence of a Category II violation or two category III violations;
(D) 3 = past occurrence of a Category I violation, two Category II violations, or three Category III violations:
(E) 4 = past occurrence of two Category I violations, three Category II violations or four Category III violations;
(F) 5 = past occurrence of three Category I violations, four Category II violations, or five or more Category III violations;
(G) 6 = past occurrence of more than three Category I violations or five or more Category II violations.
(c) H = History of the person in taking all feasible steps or procedures necessary and appropriate to prevent or correct a violation. H will be weighted from -2 to 2 in the following way:
(A) -2 = the person took all feasible steps to correct any prior violations:
(B) 0 = there is no prior history or insufficient information on which to base a finding;
(C) 1 = the person took some, but not all feasible steps to correct prior violations;
(D) 2 = the person took no action to correct prior violations.
(d) R = Preventability of the violation and whether negligence or misconduct was involved. R will be weighted from -2 to 7 in the following way:

(A) -2 = the person's actions determined to be violative were unavoidable;
(B) 0 = information is insufficient to make any finding;
(C) 3 = the person's actions determined to be violative were reasonable avoidable;
(D) 7 = the person's actions were flagrant or reckless.
(5) A civil penalty imposed under the applicable statues and these rules may be remitted or reduced at the director's discretion upon such terms and conditions that are proper and consistent with public health and safety.
(6) At the discretion of the director, a respondent who is unable to pay the full amount of a civil penalty may be allowed to pay the civil penalty by means of a schedule of payments which may include payment of interest on the unpaid balance for any delayed payments.