MALHEUR RIVER BASIN
AGRICULTURAL WATER QUALITY MANAGEMENT AREA PLAN

Developed by the

Oregon Department of Agriculture

with assistance from

Malheur River Basin Agricultural Water Quality Local Advisory Committee

and

Malheur County Soil and Water Conservation District

February 15, 2001

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ACRONYMS

AgWQM	Agricultural Water Quality Management
CWA	Clean Water Act
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
LAC	Local Advisory Committee
NRCS	Natural Resources Conservation Service
ODA	Oregon Department of Agriculture
OSU	Oregon State University
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture

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FOREWORD

This Agricultural Water Quality Management (AgWQM) Area Plan provides guidance for addressing agricultural water quality issues in the Malheur River Basin. The purpose of this AgWQM Area Plan is to identify strategies to reduce water pollution from agricultural lands through a combination of educational programs, suggested land treatments, management activities, and monitoring. The provisions of this AgWQM Area Plan do not establish legal requirements or prohibitions. The Oregon Department of Agriculture (ODA) will exercise its enforcement authority for the prevention and control of water pollution from agricultural activities under administrative rules for the Malheur River Basin, and Oregon Administrative Rules 603-090-0060 through 603-090-0120.

The administrative rules for the Malheur River Basin set forth the requirements and/or prohibitions that will be used by the ODA in exercising its enforcement authority for the prevention and control of water pollution from agricultural activities. In addition, Oregon Administrative Rules 603-090-0060 through 603-090-0120 describe the enforcement actions that may be triggered upon the finding of a violation by the ODA.

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INTRODUCTION

The 1993 Oregon Legislature, in passing Senate Bill 1010, provided for the ODA to be the lead state agency working with agriculture to address water pollution. Federal law, the Clean Water Act, requires each state to develop and implement a program to control water pollution. Oregon adopted Senate Bill 1010 to give agriculture an effective way to meet the requirements of federal and state clean water regulations.

The Federal Clean Water Act (CWA) requires each state to identify beneficial uses for each water body; designate parameters to monitor for each beneficial use, establish a standard for each parameter, to report findings to Congress every two years, and to correct water quality problems.

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

The CWA also requires each state to develop a strategy and Total Maximum Daily Load (TMDL) to reduce pollution on each water body on the 303(d) list. A TMDL refers to the total amount of a pollutant a stream can accept and still support beneficial uses. In Oregon, the Department of Environmental Quality (DEQ) has the responsibility for determining beneficial uses, standards, and whether beneficial uses are being supported. DEQ also has the authority to develop TMDL's for point and nonpoint source pollution. ODA develops management plans and regulations to control pollution arising from agricultural activities, and the Oregon Department of Forestry has the responsibility for forestry related activities on private lands.

This AgWQM Area Plan was developed by the ODA with assistance from volunteer members of the Malheur River Basin Agricultural Water Quality Local Advisory Committee (LAC) and the Malheur County Soil and Water Conservation District (SWCD), in consultation with members of the community. All entities involved in developing this plan are committed to maintaining and improving the economic viability of agriculture in the Malheur River Basin. Productive and profitable agriculture is the cornerstone of the local Malheur River Basin economy. Social well-being is directly tied to this agricultural activity and the value-added processed goods provided. The income from these enterprises is indispensable.

The agricultural community of the Malheur River Basin has a sincere desire to protect the natural resources that everyone depends on. Most farmers and ranchers in the area have demonstrated that concern by applying environmentally friendly practices on their property. Many have implemented conservation projects to improve water quality and protect wildlife. Local growers and agencies have shown by implementing the Northern Malheur County Groundwater Protection Plan (Anon., 1991) that they can protect natural resources and maintain profitable agriculture.

In summary, this AgWQM Area Plan provides farmers, ranchers, and other agricultural land users in the plan area a tool to achieve the following conditions on the land they occupy and manage:

1. Sediment in irrigation return flows within acceptable levels.
2. Stream bank erosion within acceptable levels.
3. Elimination of placement, delivery, or sloughing of wastes into streams.
4. Adequate riparian vegetation for bank stability and stream shading consistent with vegetative site capability.
5. Sufficient vegetation on rangelands and pastures to filter sediment, utilize nutrients, control soil erosion, optimize infiltration of water into the soil profile, and minimize the rate and maximize the duration of runoff from precipitation.

Farmers, ranchers, and other agricultural land users are not expected to achieve all of the above conditions immediately. Each condition has a timeline associated with it. However, landowners are expected to take current action in adapting their management techniques so that they can control the conditions on their property.

The purpose of this AgWQM Area Plan is not to tell anyone how to farm, ranch, or otherwise utilize their natural resources. However, the Natural Resources Conservation Service (NRCS) along with SWCD personnel in local offices can provide technical assistance to help farmers, ranchers, and other agricultural land users to meet all of the requirements set forth in this AgWQM Area Plan. For detailed information relating to the AgWQM Area Plan requirements please refer to the Administrative Rules (OAR 603-095-0940).

MISSION STATEMENT

While emphasizing commodity production, ensure that surface water and groundwater influenced by agricultural activities comply with or are making measurable progress toward achieving water quality standards.

GOALS

PRIMARY GOAL:

Encourage voluntary compliance by agricultural producers with federal and state requirements to solve point and nonpoint source pollution through voluntary farm planning, technical assistance, financial assistance and educational programs to increase awareness.

Goal 1: Secure adequate funding for administration and implementation of the program to achieve this plan's mission, goals, and objectives

Tasks**:**

1. Ensure adequate administration of the Malheur River Basin Agricultural Water Quality Area Management Plan.
    - LAC and ODA request that the Malheur County Soil and Water Conservation District includes the Senate Bill 1010 project in their annual and long range work plans.
    - ODA, Malheur-Owhyee Watershed Council, OSU and the Malheur County SWCD obtain funding for implementation of Effective Management Practices, research into developing new Effective Management Practices, conservation planning assistance, conservation education, and water quality monitoring.
    - ODA, Malheur-Owhyee Watershed Council, OSU and the Malheur County SWCD submit grant applications to US Department of Agriculture (USDA), EPA, DEQ, ODA, and other funding agencies for demonstration and conservation projects.
    - ODA, Malheur-Owhyee Watershed Council, OSU and the Malheur County SWCD submit progress reports to granting agencies.
    - ODA, Malheur-Owhyee Watershed Council, OSU and the Malheur County SWCD form partnerships with the agribusiness sector for additional funding.
    - ODA and the Malheur County SWCD promote USDA incentive based cost share programs to assist producers with conservation plan implementation.

Goal 2: Enhance the level of awareness and understanding of water quality issues in the public and the agribusiness community.

Tasks:

1. Conduct education programs to promote public awareness of water quality issues and their solutions.
   - Conduct workshops on water quality issues and the conservation practices that will help improve water quality.
   - Develop demonstration projects to showcase successful conservation practices and systems.
   - Organize tours of demonstration projects for agricultural managers and producers.
   - Produce and distribute brochures about water quality issues.

2. Develop an ongoing media program to inform the Malheur River Basin public and agricultural operators of conservation issues and events.
   - Submit news articles and public service announcements to area newspapers, radio stations, and newsletters. In particular, target the agricultural programs on the radio.
   - Invite media to conservation tours and workshops.

3. Involve the agricultural community in conservation education.
   - Create and maintain a list of experienced agricultural operators willing to share their Effective Management Practices with other interested people by speaking, leading tours, and providing tour sites.

4. Build partnerships with agribusiness to promote conservation.
   - Co-sponsor workshops and tours with the Soil and Water Conservation District.
   - Share education materials with agribusiness field representatives.

Goal 3: Determine the site capabilities of riparian areas in the Malheur River Basin.

Tasks:

1. Determine the site capabilities of the rangelands, streams, and riparian areas to support the goals for this management plan.
   - Seek funding to determine and map site capabilities.
   - Map riparian site capabilities for the Malheur River Basin.

2. Publicize our better understanding of southeastern Oregon ecosystems and their site capabilities to the general public and to the agricultural community in particular.

Goal 4: Foster the development of new Effective Management Practices so that Effective Management Practices are viewed as a changing array rather than a static set of practices. Innovations in science are needed to improve and broaden practice options.

Tasks:

1. Continue developing innovations in drip and other types of irrigation.

2. Determine the effects on stream flows and on grazing of the conversion from sage and juniper dominated communities to communities dominated by herbaceous plants.

3. Determine the season and intensity of grazing in riparian zones compatible with the maintenance and vigorous recovery of riparian vegetation and stream functions.

4. Determine which combination of treatments are needed to achieve effective weed control on public and private land to protect agriculture and water quality.
   - Continue existing educational programs promoting weed identification and control.
   - Determine what forage species could be combined with biological and/or herbicide control measures to compete with noxious weeds.
   - Apply for grant money to supplement private landowner weed control efforts.

5. Examine how to manage constructed wetlands placed within surface drainage ditches and at the ditch outlets to prevent and control sediment and nutrient inputs into rivers and creeks.

Goal 5: Increase the adoption of Effective Management Practices to improve water quality (Effective Management Practices: Responsible Agencies: Malheur County SWCD, NRCS, OSU, Malheur-Owhyee Watershed Council, ODA).

Tasks:

1. Identify Effective Management Practices that will protect and improve water quality in the Malheur River Basin.
   - Develop and distribute a list of Effective Management Practices.
   - Access ongoing research into Effective Management Practices.
   - Obtain practical knowledge from agricultural producers.

2. Encourage agricultural producers to implement Effective Management Practices.
   - Promote the benefits of having an individual farm conservation plan that incorporates Effective Management Practices.
   - ODA will provide assistance in planning and implementation to the SWCD, NRCS, and partner organizations.
   - Showcase positive and effective conservation practices through workshops and tours of demonstration projects.

Goal 6: Monitor and evaluate the effectiveness of the plan.

Tasks:

1. SWCD, NRCS, OSU, and the Watershed Council work with the ODA to establish how they will measure plan success.
   - Inventory and assess baseline watershed conditions and sources of pollution in the Malheur River Basin.
   - Establish a plan of monitoring streams and surface water areas that will accurately reflect current water quality conditions.
   - Use present water quality conditions of the Malheur River Basin as a baseline.
   - Access and evaluate monitoring data acquired by the local watershed council or other agencies.
   - Inform all landowners of monitoring results.

2. Determine number of producers implementing Effective Management Practices.
   - Document the number of plans written and the acreage involved.

3. Monitor the occurrence of prohibited conditions in the Malheur River Basin (ODA's responsibility).
   - Document the number of complaints.
   - Inventory key areas in the watershed for occurrence of prohibited conditions.

- Monitor the availability of cost-share funds compared to the demand for conservation planning.

4. Make revisions to the plan and rules as necessary based on continuing evaluations of this plan.

GEOGRAPHIC SETTING

The Malheur River Basin Agricultural Water Quality Management Area includes the drainage area of the Malheur River and all its tributaries from the headwaters to the mouth, and the Moores Hollow and Jacobsen Gulch subbasins.

The Malheur River Basin lies in east-central Oregon, and its drainage area covers 4,610 square miles. About 63 percent of the area is in Malheur County, 27 percent in Harney County, and small areas in Grant and Baker Counties. The Malheur River is 190 miles long, and its headwaters are in the Strawberry Range at an elevation of about 9000 feet. The Middle Fork flows southeasterly for 65 miles, where it turns north for 19 miles to a junction with the North Fork at Juntura, it then flows northeasterly to its confluence with the Snake River at Ontario.

The principal tributaries are the North Fork starting at Baker County heading south toward Beulah Reservoir and on to Juntura, the Middle Fork (described above), and the South Fork originating above Venator in Anderson Valley country (Harney County) flowing north-northeast where it joins the Middle Fork near Riverside below Warm Spring Reservoir. The Middle and North Forks originate in designated wilderness areas. The main stem of the Malheur River flows from Juntura to Ontario where it enters the Snake River.

High Lake is the only natural lake of any significant size in the basin, and it is a popular recreation area. However, a number of reservoirs are in the basin. The Middle Fork is dammed by Warm Springs Dam just above the confluence of the South and Middle Forks, and the North Fork is dammed 18 miles above its confluence with the Malheur at Juntura. Bully Creek is dammed 14 miles above its confluence with the Malheur, and Willow Creek is dammed 41 miles above its confluence with the Malheur at Vale. The South Fork is not dammed.

Climate

The climate is semi-arid with hot, dry summers and cold winters. Summer high temperatures average between 85-95 F and can be higher than 100 F. Winter high temperatures average in the 20's and can dip to -45 F. Precipitation averages 8 to 40 inches annually, depending on location and elevation. Most precipitation occurs during the winter as snow, and this mountain snowpack is an important source of water for irrigation, fish, wildlife, livestock, domestic water supply and other uses.

The area is prone to have sudden, short but intense storms. These storms can cause erosion and high amounts of run-off. Despite the dams in the watershed, flooding can occur in the Vale and Ontario areas. Flooding also occurs higher up in the basin. For example, the town of Drewsey experiences flood events quite often, sometimes more than once in a 10 year period. A primary cause of flooding is rain-on-snow events. During these events, precipitation exceeds soil water infiltration rates and water quickly reaches streams and rivers. Floodwaters can scour stream banks and damage riparian vegetation.

Topography/Geology

Most of the basin consists of gently sloping plateau uplands separated by river canyons or valleys. Elevations range from around 2000 feet near the Malheur River's confluence with the Snake River to mountainous plateaus above 5000 feet and isolated peaks above 9000 feet. Three main geographic divisions occur in the Malheur River Basin: (1) low elevation terraces and floodplains in the irrigated eastern part, (2) grass-shrub uplands comprising the majority of the basin, and (3) forested uplands in the northwestern portion. These generally correspond to the Snake River Plain, Sagebrush Steppe and Blue Mountain Provinces.

The low-elevation terraces and flood plains that run parallel to the Snake River and extend up the valleys of the Malheur River and Willow Creek are important agricultural areas. These irrigated areas are under intensive agricultural management for the production of sugar beets, onions, potatoes, corn, mint, grain, alfalfa seed, vegetable seed, irrigated pasture, and hay.

The grass-shrub uplands consist mainly of rolling, hilly terrain underlain by old sediments and volcanic deposits. Sagebrush and native bunchgrass communities at higher elevations dominate the Malheur River Basin. Big sagebrush/bunchgrass communities are the most widespread types in southeastern Oregon. Sagebrush/annual grass communities are common at lower elevations. Perennial grasslands dominate for long periods following fire due to the reduction of overstory canopy and subsequent release of the grasses.

The forested uplands are located in the northwest corner of the basin. Prior to fire suppression, open ponderosa pine stands dominated. Presently, understory conifers and shrubs crowd the forests. More frequent fires would reduce this crowding. Forested areas are used for livestock summer range, and are important for deer and elk habitat. Some native hay is produced by flooding the meadow basins at intermediate elevations.

Water Resources

The Malheur River system can be categorized into three separate zones: (1) the upper zone, above the reservoirs, (2) a middle zone, below the reservoirs to the irrigation diversion dams, and (3) a lower zone, from the diversion dams to the mouth.

The flow in the upper zone above the reservoirs is controlled by natural climatic cycles resulting in high spring flows and low summer flows. Flows on the Middle Fork at Drewsey range from 12,000 cfs at peak flood stage to zero during dry years. On the North Fork above Beulah Reservoir, flows range from 4,000 cfs to 8.5 cfs.

The flow in the middle zone, from Beulah and Warm Springs Reservoirs to the Vale-Oregon Canal Diversion at Namorf, is managed according to irrigation water demand in the lower agricultural valley during the irrigation season (April to mid-October). During the winter months, however, the flows are greatly reduced due to water being stored in reservoirs for the following irrigation season. Winter flows are limited to leakage from the reservoirs, natural springs and flows from the South Fork. During the spring, water may be released from the reservoirs in accordance with the rate of snowmelt and inflow into the reservoir. Normally during the irrigation season, water released from Beulah Dam averages between 75 and 300 cfs.

Occasionally the area experiences spring floods despite the control provided by the reservoirs. This happens when heavy rains or fast snowmelt occur. It is also important to note that the South Fork has no reservoir. Flooding may cause streambank erosion, damage to riparian vegetation and increased runoff.

Building a new dam in the Vines Hill area is one way to improve the efficiency of this system. Currently irrigators must request water from Warm Springs Reservoir 4 days in advance. This causes several water quality problems. One example is if in that 4 day period a storm occurs it could cause flows beyond what the channel can safely handle. A dam at Vines Hill would reduce the travel time of irrigation water to 12 hours. This greater control would reduce the chances of unexpected high flows, and match water deliveries to crop needs. This dam would also capture and store more water for later in the season, which would provide more irrigation water and late-season in-stream flows.

Another advantage this proposed dam provides is mitigation for possible lost water from Beulah Reservoir. Water from Beulah could be lost because bull trout use Beulah Reservoir at various times of the year. One possible way of improving the habitat for this endangered species is to maintain a minimum pool behind the dam, which could mean less water for irrigation. Building a dam at Vines Hill could mitigate this possible loss of storage.

The lower zone, from Namorf to the mouth, is characterized by several irrigation diversion dams. This zone is a mixing zone for irrigation return from several drain canals and from Bully Creek and Willow Creek. The summer flows vary according to irrigation water demand, amount of water diverted into the various canals, and amount of return flow.

Willow Creek is a tributary to the Malheur River and enters it just east of Vale. From the mouth up to Brogan, Willow Creek has been straightened to facilitate farming. The natural channel has been eliminated, and the present creek serves as an important drainage and irrigation canal for farmland in the area. Willow Creek between Brogan and Malheur Reservoir has been placer mined and dredged for gold and silver in the past. The flow in this reach of the river is controlled by water released from Malheur Reservoir. Above the reservoir, water flow is controlled by natural cycles and irrigation demand.

Bully Creek is another tributary to the Malheur River and enters the river west of Vale. Above the reservoir, water flow is controlled by natural cycles and irrigation demand. Much like Willow Creek, the lower reaches of Bully Creek have been straightened to facilitate farming, and the current creek serves as an important drainage and irrigation canal for farmland in the area.

Agriculture's Economic Importance to the Malheur Basin

Agriculture and its related industries are the largest sector of the Malheur County economy(Malheur Action Plan, 1999). When measured by the percentage of total sales, food crop procurement and processing was the largest industry, followed by crop production, livestock production, procurement and feeding, and wholesale and retail trade. The estimate of Malheur county gross agricultural income for the year 2000 was $196,444,000 (OSU Extension Service, Malheur County). Cattle and onions were the commodities that produced the largest farm income in the county for 2000.

The 1997 Census of Agriculture estimated that Malheur County had 1,207 farms that covered 1,257,201 acres. The average market value of the land and buildings was $655,345 per farm, and the value of all the machines and equipment on average was $103,558.

Irrigation

Irrigation practices in the Malheur Basin, particularly in the row crop areas, differ from those in most areas in Oregon. Furrow irrigation is the primary technique farmers use. Furrow irrigation consists of placing water in furrows and allowing the water to proceed downhill by gravity.

When the water reaches the end of the field it is collected in a small ditch, which could direct it to a variety of places. Usually the water is returned to an irrigation ditch and reused by another farmer down the line. By the time the water is returned to the Malheur or the Snake River it has been used several times.

The Bureau of Reclamation and private companies developed the irrigation system with this reuse of return flow in mind. The system consists of diverting water from a reservoir or from the river to a main canal then to smaller canals and laterals and finally to individual farms. The main canals are arranged one below the next to catch the return flow. During the later part of the irrigation season the water in many of these ditches is entirely return flow. An example is the Nevada Ditch, one of the lower ditches. By the middle of June in most years all the water in this ditch has been used for irrigation at least once if not many times.

In many ways this reuse of water is efficient. It helps spread the amount of water longer in the season. This system would be difficult to change because of the complexity of its design and many other considerations (personal communication, Scott Ward, manager, Vale Irrigation District).

A critical barrier to conversion from flood irrigation is the cost of electrical power to run water pumps. With commodity prices low and expenses high, farmers could not afford the added costs of pumping and stay in business. Not only are the electrical usage rates high, but the expense and time required to construct facilities to deliver the power to the fields would not be cost effective at this time.

WATER QUALITY ISSUES

Federal Clean Water Act

The Federal Clean Water Act (CWA) requires each state to determine water quality (identify beneficial uses for each water body; designate parameters to monitor for each beneficial use; and establish a standard for each parameter, and analyze water quality for compliance with the standards which have been set), to report findings to Congress every two years, and correct water quality problems.

Section 303(d) of the CWA requires each state to develop a list of water bodies that do not meet the standards designed to protect the most sensitive beneficial use. Water bodies that do not meet standards are placed on the 303(d) water quality limited list. Some rivers and streams in the Malheur River Basin do not meet water quality standards for the following parameters:

- water temperature
- bacteria
- toxics
- dissolved oxygen
- chlorophyll a
- and flow modification

Table 1 in the Appendix contains the waterbodies in the Malheur River Basin on the 303 (d) list, and Figure 1 is a map showing these listed rivers and streams.

Resource Condition/Assessment

Resource assessment in this context means an evaluation of historical, existing and potential resource conditions in the Malheur River Basin and how they may relate to water quality and watershed health.

Native American Activities

Humans have influenced resource conditions in the basin for thousands of years. Prior to European settlement of the basin, ancestors of the Burns-Paiute people used the natural resources of the area to sustain themselves. They were called the Wadatika Band, one of several bands of Northern Paiute. The band's name stems from the wada seeds they collected for food (Jerofke, 1999). The Wadatika's territory included more than 5,000 square miles and covered the area between the Cascade Mountain Range in Central Oregon and the Boise, Idaho valley area and from the southern part of the Blue Mountains near the headwaters of the Powder River north of John Day to the desert south of the Steens Mountain to the Nevada border.

Archeological evidence indicates the Wadatikas lived primarily near Malheur and Harney Lakes 10,000 years ago. But as the climate changed and the lakes dried up, they began to make seasonal migrations in search of food. Small family groups would travel separately. Throughout the year the groups would hunt deer, elk, mountain sheep, small animals, and birds. In the spring they would gather roots on the hillsides and meadows, and fish for salmon in the Middle Fork of the Malheur River. During the summer they collect huckleberries and stored them for winter use. By late summer and early fall the Wadatikas harvested roots and seeds from the hills and the desert. Family groups gathered together during this season for communal antelope and rabbit drives. Late fall and early spring was the time they collected plant materials to make sandals, baskets and clothing. They constructed small dwellings, usually near springs, to spend the winter (Jerofke, 1999).

The Wadatikas first encountered European fur trappers in the 1820s and Oregon Trail pioneers in the 1840s. Europeans began permanent settlements in the area by the early 1860s. The bands continued their migrations until the late 1860s until the U.S. army broke the seasonal pattern.

By the 1840s the Northern Paiute bands had acquired horses (Jerofke, 1999). Some reports by early explorers indicate that at least some Paiute bands in what is now Nevada had horses before the 1820s. Clearly horses and other European goods were introduced into the surrounding area by the mid-to-late 1700s (Fowler and Liljeblad, 1986).

Willard Park interviewed tribal members in the 1930s and 40s. His notes were compiled by Fowler (1989). The tribal members described obtaining horses from the Bannock Tribe of Idaho who lived along the Snake River. Trips to trade for the horses could take one or two months. At first there were very few horses, but they multiplied quickly. These horses were small and hardy, and were considered valuable property. Typically when a man died his horses were killed.

Disputes among the Europeans and the Paiute bands over the land and its resources were frequent, and eventually led to the defeat and deportation of the native peoples. The Paiute population declined drastically after their first contact with Europeans. In the 1820s and 30s disease epidemics killed many. During the winter of 1868 they lost half their population to hunger, cold, and war. At this time it is estimated their numbers were down to 2,000 people, and by 1878 only about 700 remained.

After many years and many disputes the Burns Paiute Reservation was established. Today, individual Tribal members own more than 11,000 acres scattered in areas to the east of the reservation, and there are 302 enrolled Tribal members.

Soil Erosion

Historically, upland soils and drainage channels eroded in the basin due to some land use practices, and natural causes such as catastrophic storms. Ephemeral drainages (those running during spring runoff and intense summer storms) were deeply incised by gully erosion many years ago. Erosion caused by natural processes, such as flooding, and by concentrated uses still occurs. The effects of lost soil productivity are evidenced by changes in vegetation composition in some rangelands and lowered water tables along certain riparian sites. Past and current land use management practices have reduced erosion and begun the healing process.

Some poor agricultural management in the past contributed to excessive loss of topsoil and sediment flows into the Snake River system. However, improved tillage, irrigation, and harvest practices have reduced lowland soil and sediment loads in the planning area's waterways. Recent practices of laser leveling, straw mulching, polyacrylamide, filter strips, sediment ponds and incorporation of sprinkler and drip irrigation in place of surface flood irrigation have been successful in retaining cropland topsoil thus reducing and controlling water pollution.

Early livestock use of the valley areas including Vale-Ontario-Nyssa and surrounding bench lands was detrimental to many range sites. The Oregon Trail and stock driveways experienced major shifts in vegetation composition due to the impacts from continuous livestock use. In addition, low precipitation range sites (9-10 inches or less) are very sensitive, and are slow to recover, if at all.

Public land livestock grazing today is less than half of what it was in the early history of settlement in the west. Vegetation problems that occur on the range now are due to a variety of causes. Some examples are:

- The invasion of noxious weeds and fire suppression which have altered the historic vegetation composition.
- Building access roads and highways, which changed the valleys, drainage ways, streams, and vegetation.
- Re-channeling of streams to accommodate human traffic has also influenced vegetative changes. Most native vegetation in the arid, lower elevation valleys has been replaced by agricultural crops.

Noxious Weeds

One example of vegetation change is the presence noxious weeds. These weeds can harm water quality in many ways. Some examples are:

- reduced ground cover resulting in increased erosion
- reduced infiltration of precipitation into the soil, and
- crowding out of vegetation appropriate to each site

In Oregon, noxious weeds have become so thoroughly established and are spreading so rapidly that they have been declared a menace to public welfare. Noxious weeds are present in large enough numbers to be a serious problem in many portions of the Malheur River Basin, they grow along all segments of the Malheur River and its tributaries. They are also found along many roadsides because roads are a primary avenue for spreading weeds.

Higher elevation ranges in the Malheur River Basin were relatively free of noxious weeds in the past. However, colonies of whitetop and knapweed are presently gaining a foothold in many areas. Colonies of yellow star thistle, skeleton weed and tamarisk pose new threats. Perennial pepperweed is widespread along the South and Middle Forks of the Malheur River, Scotch thistle is established to pose a danger to the Middle and North Forks of the Malheur River, and Russian knapweed occurs on the North Fork Malheur River.

Along the middle portion of the Malheur River from Juntura to Harper, Scotch thistle and water hemlock are increasing and present real threats of further expansion. Whitetop has become established on many range sites from Juntura to Riverside.

Medusahead rye is commonly found in lower elevation clay soils and has infested many such sites along the South and Main Forks of the Malheur River.

The Bully Creek segment is contaminated by Russian knapweed along Indian Creek to Dahle bridge (over 60 acres). Scotch thistle infests Bully Creek from its headwaters all the way to its mouth at Vale, including the edges of Bully Creek Reservoir. Whitetop also infests thousands of valuable acres of rangeland in this watershed.

The Willow Creek segment is heavily infested with whitetop around Ironside. Scotch thistle grows along the county roads, and it is just starting to move off these roads and into the rangeland. Scotch thistle infests Willow Creek from Malheur Reservoir all the way downstream to Vale where it joins the Malheur River. Leafy spurge contaminates Willow Creek from Basin Creek to the diversion dam for the Brogan Ditch. Scotch thistle also infests the land around Pole Creek Reservoir.

The lower portion of the Malheur River is heavily infested with noxious weeds. Perennial pepperweed has taken over some riparian zones. Whitetop, Scotch thistle, Canada thistle, water hemlock, bull thistle, and some Russian knapweed compete with native vegetation. Scotch thistle infests most ditches and adjacent rangeland. Weed management is critical in riparian areas. Land managers must use a variety of tools to prevent and control weed infestations in these areas. Some tools available include:

- livestock grazing,
- fire,
- chemical,
- mechanical, and
- biological controls.

Juniper Expansion

Although western juniper is a native plant, wide expansion of juniper stands may threaten the integrity of plant and animal communities and late summer stream flows throughout eastern Oregon and specifically in the Malheur River Basin. The natural distribution of juniper was restricted to rocky ridges and cliffs where there was little grass to fuel fires. Thus these small stands were protected from fire. With the recent efforts to suppress fires, juniper stands are expanding and replacing more diversified plant and animal communities. Juniper populations are high in parts of the northern and western uplands of the Malheur River Basin. Age-class studies conducted elsewhere confirm that most junipers are recent invaders into the landscape.

The more diverse plant communities replaced by juniper supported more wildlife, help to provide cleaner, cooler water for streams and forage for livestock. Juniper domination leaves the soil more exposed to rapid runoff and erosion. Juniper may use enough water during the summer to reduce aquifer recharge, an indispensable factor in maintaining late season stream flows. Increased late season flows would help improve water quality.

Only a minority of the land area at the upper elevations in the Malheur River Basin may have the potential for storing late winter and early spring precipitation in shallow aquifers. These aquifers slowly release water to upland stream throughout the year, including critical periods in late summer.These same upland areas are being progressively invaded by juniper. The role of juniper in reducing the capacity of rangelands to store water needs to be critically examined. Management that emphasizes fire suppression will lead to greater juniper invasion and potentially less aquifer recharge. In the Malheur River Basin some areas critical for recharge are already infested with juniper, and adjacent areas are full of small trees that could be poised to emerge as major users of deep soil water. Oregon's commitment to water quality will need to encompass effective juniper control.

In the Malheur River Basin there is a need to:

- determine the role of juniper in limiting soil water storage and aquifer recharge, modifying the pattern of water yield from sustained year-round flow to high spring runoff followed by minimal summer and fall flows,
- quantify the competitive impacts of juniper on other species,
- document the expansion of juniper,
- model the watershed in terms of water delivery with and without controlling juniper, and
- establish effective juniper control practices in the basin.

Riparian Areas

In upper reaches, bluegrasses and annual grasses have replaced many of the native sedges, rushes and grasses. Some native riparian grasses, shrubs and trees have been overused by both livestock and wildlife and are in poor condition. Many drainages have been invaded by juniper and sagebrush in many cases due to lowering of the water table and fire suppression. Recently, efforts have been made to protect valuable reaches of riparian habitats through such activities as improved grazing systems.

Road building has had an influence on streams in the basin. When roads were built next to streams for example, riparian vegetation was often removed, and these roads limit the ability to re-establish this vegetation. Reduction of streamside vegetation and road building near streams has caused some loss of proper hydrologic function.

Water diversions and irrigation return flows from agriculture have modified the lower reaches of many streams to accommodate agriculture. Dams and irrigation have altered the natural flow regime of the basin. This has several consequences, many of which are positive. For example reservoir storage means higher flows late in the year, and dams capture peak flows which reduces the potential for stream bank erosion from spring run-off. With less scouring and higher late season flows, riparian vegetation will have a better chance to establish and develop.

Healthy riparian vegetation benefits farmers and ranchers. Some benefits include increased forage production, reduced streambank erosion, increased late season flows and stable stream channels. Techniques that improve riparian area management can lead to economic benefits as well. One example is Bear Creek on the Bureau of Land Management's Prineville District. Prior to 1976 the area was a single pasture licensed for 72 animal unit months. Riparian vegetation and stream channel conditions were poor. After the Bureau of Land Management and the permittee changed their management, animal unit months are now almost 360 and the permittee is spending less money on his annual hay bill. Riparian vegetation has recovered, streambank erosion has decreased, and the quality and quantity of the flow has improved to the point that trout use the area (Leonard et al., 1997)

Livestock

Gold rushes, mining in southwestern Idaho, and immigration along the Oregon Trail brought settlers into the region. Horses were needed for transportation, and cattle and sheep were needed for food. Locally, heavy stocking of domestic livestock probably began with the discovery of gold in 1863. By 1875, cattle, sheep, and horses occupied the grazing land of the basin. Cattle herds expanded in the latter decades of the 1800's as the railroads were extended. By the turn of the century, rangeland deterioration was severe adjacent to areas of settlement at Vale, Harper, Westfall, Brogan, and other settlements along the Malheur River. Land adjacent to these settlements was often grazed year-round including the spring growing season. In addition, historical trailing routes to shipping points at Burns, Riverside, Juntura, Harper, and Vale were used heavily by large numbers of animals.

Higher elevation rangelands were only available for summer use and then only where adequate water was available. Because of the additional livestock management required to make use of these areas, the intensity of livestock use and resulting impacts were often less than in areas closer to settlements. Many areas remained unavailable to livestock use due to lack of water or limited accessibility.

The impacts of livestock grazing from the 1860's through the 1940's were concentrated at low elevations where temperatures were hottest, rainfall the lowest, and the dry season the longest. In these areas, native vegetation communities were replaced with introduced annuals and weedy species. Today, these areas continue to have the greatest need for reestablishment of perennial vegetation.

An account of a trip in 1901 from Winnemucca, Nevada to Ontario, Oregon written by Dr. David Griffiths gives some perspective of what range conditions were and how much progress has been made since this time. He noted that sheepherders and some cattlemen ran large numbers of animals in the area, and that management was in the form of competition to get to the best grass first. According to Griffiths, quarrels over pasturage were common, and when feed was short some areas were grazed more than once per season. During this era large numbers of livestock were in the area. Griffiths estimated that more than 180,000 sheep were in the Steens Mountain area alone and that was in addition to cattle present.

With these figures before us it is needless to say that feed was short, and that already in August some flocks were being driven onto what is known as winter pasture on the lower levels, which are not usually pastured until the middle of October.

Numerous range improvements to enhance livestock distribution patterns have taken place since the 30s and continue today. The authorization of the Taylor Grazing Act in 1934 spurred many of these changes. Under this Act the Secretary of the Interior was to create and enforce rules for using the public lands with the following goal: "to preserve the land and its resources from destruction or unnecessary injury, to provide for the orderly use, improvement, and development of the range."

A special appropriations bill passed in 1962 funded the Vale Project, a county-wide program of land treatments to rehabilitate rangeland resources. Through the end of the Vale Project in 1973, brush control treatments covered 506,570 acres and seedings were implemented on 267,193 acres. Additionally, 1,994 miles of fence were built, 583 small water-retention reservoirs built, 440 springs developed, 28 wells drilled, 463 miles of pipeline laid (including 537 troughs), and 360 cattleguards installed.

Vegetation treatment projects completed since passage of the 1978 Public Rangelands Improvement Act have brought the total area on which brush controls have been implemented within the planning area to 678,976 acres. Seedlings have been established on 393,424 acres.

These figures are for all of Malheur County, not only for the Malheur River Basin, and most of these numbers account for what occurred on federal land. The improvements on private land have been extensive, but accurate records are not available.

Another historic livestock practice worth noting is feral pig management. Up until the late 1950s and early 60s it was common for land managers to release pigs and let them forage on their own as wild pigs would. When pig numbers reached a point where they became a nuisance (pigs getting into hay stacks for example) the pigs would be gathered up and sold. This is not commonly done now, and current law (Oregon Revised Statute 608) prohibits pigs from wandering off a landowner's property.

Groundwater

Well monitoring studies by state and federal agencies detected nitrate and Dacthal di-acid contamination in the shallow aquifer within the Lower Willow Creek and irrigated portion of the main Malheur River Basin. This area of the Malheur River Basin was designated a Groundwater Management Area in 1989 by Oregon DEQ for nitrate and Dacthal residue levels.

Nitrate concentrations found in the groundwater are strongly influenced by agricultural fertilization, shallow depth to water table, large amounts of irrigation water applied, permeable soil types and direction of ground water flow. Although nitrates were detected in the majority of the wells, only some of the wells were above EPA maximum contamination level for drinking water (10 mg/l for nitrate-nitrogen). The highest levels of nitrate contamination occurred in the vicinity of the Cairo Junction, Vale, Annex, and Nyssa areas.

Dacthal was a herbicide commonly used in onions for decades until 1998 when its use was discontinued. Dacthal residue levels ranged from no detection to several hundred parts per billion. A lifetime health advisory level of 4000 parts per billion has been established by the EPA for Dacthal and its breakdown products.

Groundwater moves an estimated 0.4 mile per year in the Cairo Junction area. Therefore, it may take over 11 years for water in the Cairo Junction area to discharge. Other estimates have indicated it will take 20 years for the groundwater to move from the upper reaches of the aquifer to the lower discharge areas.

The contamination of nitrates and Dacthal di-acid is believed to have occurred over decades of irrigation. Through voluntary implementation of improved practices such as irrigation water and nutrient management, the shallow aquifer has started showing declines in nitrate and Dacthal residue levels (Shock, et al., 2000). Due to the slow movement of the groundwater in the shallow aquifer, it will take decades to realize the full benefit of improved agronomic practices.

Surface Water

Cropland drainage systems in the Vale/Ontario area route irrigation discharge waters back to the Malheur and Snake Rivers. These return flows are high in nutrients and sediment at times. Pastures and confined animal feeding operations can contribute nutrients and bacteria into drainage systems and eventually rivers and streams. Local storm events and spring runoff from snowmelt accelerate this process. Recent efforts incorporating Effective Management Practices have improved surface water quality.

A summary of accomplishments can be found in the Ontario Hydrologic Unit Area Final Report 1990 - 1997 (Anon., 1998). This report documents significant reductions in soil loss, increases in acres under nutrient management plans and gradual declines in average groundwater nitrate levels.

In 1978 the county appointed a Citizen's Water Resources Committee to develop a nonpoint source water quality management program. As part of this plan, the county conducted two years of intensive water sampling. The final report documented sediment loss, fecal coliform concentrations above acceptable levels and elevated levels of nitrogen and phosphorus in some areas (Anon., 1981). Recent sampling has shown improvements in all these areas in particular the fecal coliform levels (Anon., 1999).

Upland watershed management is a priority issue. Desirable upland native vegetation functions as a water trap and filter, where rain and snowmelt is captured and incorporated into the sub-surface soil layers. Any reduction of native vegetation or replacement by undesirable species affects water infiltration rates into the sub-soil where surface runoff may supersede infiltration.

Many riparian waterways in the basin have experienced a loss of streambank vegetation due to natural scouring, excessive use by wild and domestic herbivores, road building, and many other causes. Vegetation loss results in accelerated bank erosion, lowered water tables, higher stream temperatures and invasion by more drought tolerant vegetation. Damaged riparian sites constitute a significant loss of an essential component of the watershed's ecosystem. The original character and functioning ability of streams are changed through the simple mechanics of hydrology because the stream,s ability to store and filter runoff has been changed.

Incorporation of surface water into the sub-surface aquifer to provide recharge has, in the past, been one of the major contributors to stream flows. With the advent of irrigation and development of reservoirs, water capture and use has greatly changed seasonal stream flow patterns over much of the Malheur River Basin. One consequence is that irrigated lands have developed expanded aquifers and provide perennial surface flows in streams that used to run dry late in the season. Flood irrigation in the mountain meadow areas also contributes to ground water recharge. For example, the system of dikes and levees maintained by ranchers mimic what beavers did historically by storing and dispersing spring flood waters.

Stormwater events contribute large flows into Ontario's storm drain system. At times runoff from agricultural areas can flow into drains that run under the city. At one time these drains were strictly agricultural drains. The city grew over them, and they were covered. All flows that enter these storm drains reach the Snake River untreated.

Beneficial Uses Not Being Supported in the Malheur River Basin

Most of the water quality standards that some streams in the Malheur River Basin do not achieve relate to the beneficial use of resident fish and aquatic life. Some examples are temperature and algae (measured as chlorophyll a). In addition to aquatic life not being adequately supported, excessive levels of bacteria (E. coli) and toxics degrade the water so that standards developed for water contact recreation standards and in some cases drinking water standards are not met.

Special Status Species

Bull trout are found in the North and Middle forks of the Malheur River. In 1998 the federal government listed the bull trout as a threatened species. Redband trout may be proposed for federal listing in some watersheds within the state. It is now a state of Oregon sensitive species.

IMPLEMENTATION STRATEGY

The Oregon Department of Agriculture and the Malheur County SWCD's strategy for controlling nonpoint sources of pollution on agricultural and rural lands relies on existing and expanded programs, while focusing on proactive planning activities for those conditions which are the most significant controllable sources of nutrients, sediment, bacteria, and other sources of pollution arising from agricultural use.

Education and conservation planning are the heart of the implementation strategy. However, if a situation occurs where a landowner’s management is causing a water quality problem and all attempts at encouraging voluntary correction fail, the ODA provides a regulatory backstop to correct the problem.

Education

The Malheur County SWCD will coordinate the education efforts, and they will work with partner agencies such as the ODA, USDA Natural Resources Conservation Service, OSU Extension Service, Malheur Experiment Station and the Malheur-Owyhee Watershed Council to carry out the education strategies outlined in this plan. The focus of the educational effort will be on:

- describing historical changes in land management practices
- conservation planning
- prevention, restoration, and enhancement using Effective Management Practices
- proper management of small acreages
- programs and project funds available for conservation efforts
- riparian areas – issues and considerations, and
- water quality conditions

Conservation Planning

While the success of the plan depends on the cooperation of agencies and volunteer organizations, the adoption of conservation measures that will help improve water quality in the Malheur River Basin can only be done by individual producers. Many producers are already preventing and controlling water pollution. However, more people need to adopt better management strategies. The LAC have chosen to call these strategies Effective Management Practices. Our definition is as follows:

Effective and practicable means of preventing or reducing the amount of pollution generated by point and nonpoint sources of pollution to a level compatible with watershed plan goals. Effective Management Practices may include structural and nonstructural practices, conservation practices, and operation and maintenance procedures.

Effective Management Practices are actions taken by each individual agricultural operation for the achievement of production and water quality goals for implementation of appropriate Effective Management Practices. Landowners are encouraged to develop and implement conservation plans.

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.

A voluntary Conservation Plan is a comprehensive land management plan formulated by the farm operator and used for making decisions about applying Effective Management Practices to conserve soil, water, plant, and animal resources on all or part of a farm unit. The voluntary Conservation Plan addresses site-specific problems through the selection of individual Effective Management Practices or Effective Management Systems to be implemented for the protection of natural resources.

Voluntary Conservation Plans may be drawn up by landowners or operators, consultants, or technicians available through the SWCD or NRCS. A landowner may choose to submit a Conservation Plan to the department or its designee for approval. To be approvable, at a minimum, a Conservation Plan must outline specific measures necessary to prevent and control prohibited conditions outlined in this Area Plan.

WATER QUALITY OBJECTIVES

Resource Concern #1 - Pollution Control and Waste Management

Connection To Water Quality & Beneficial Uses Affected

Excessive concentrations of nutrients, particularly nitrogen and phosphorus, in surface water can help spur algae growth to levels that harm fish and other aquatic organisms. Algae causes large daily fluctuations in dissolved oxygen and pH, which makes conditions difficult for fish and aquatic organism survival.

Agricultural activities can affect surface water nutrient concentrations in many ways. Improper application of fertilizer can lead to contamination of shallow groundwater, which in turn can affect domestic wells and surface water. Contamination of surface water can occur when the shallow groundwater seeps into streams and rivers. Pollution of surface water can occur directly if irrigation return flows carry high levels of nutrients. Improper management of accumulated livestock waste can lead to elevated levels of bacteria and nutrients in surface waterbodies. See the discussion above regarding the consequences of excessive nutrient concentrations in streams. High levels of bacteria can, under the right circumstances, cause human illnesses. Thus the beneficial use protected by the bacteria standard is water contact recreation. That is, activities such as swimming or fishing, where people could swallow or have water touch open cuts or sores.

It is important to note that pollution is generally defined as altering the physical, chemical or biological properties of waters of the state to create a public nuisance, to harm public health, or to harm legitimate beneficial uses such as livestock drinking water, wildlife, fish and aquatic habitat.

Also “waters of the state” is defined as all waters except those private waters which do not combine or effect a junction with natural surface or underground waters. (See ORS 468B.005(8))

“Waste” includes but is not limited to commercial fertilizers, soil amendments, composts, animal wastes, vegetative materials or any other wastes. (See ORS 468B.005(7))

Performance Criteria - Critical Values

1. Runoff should be diverted away from accumulated waste or areas of high animal usage.
2. Waste accumulations should be placed on low-permeability surfaces, such as concrete, clays, or compacted silts where water does not pond.
3. Animal confinement areas should be located where there is little chance of pollutant transport to waters of the state.

Objective

To reduce waste discharge to the maximum extent that is practical.

Resource Concern #2 - Irrigation Return Flow

Connection To Water Quality & Beneficial Uses Affected

Excessive levels of sediment in tailwater discharges can harm aquatic life and can carry nutrients, particularly phosphorus, into streams and rivers. See the discussion above regarding the consequences of excessive nutrient concentrations in streams.

It should be noted that sediment is defined as soil particles, both mineral and organic, that are in suspension, are being transported, or have been moved from the site of origin by flowing water or gravity.

The Local Advisory Committee and ODA worked hard to develop a reasonable approach to controlling sediment levels in irrigation return flows. This is a particular concern in the Malheur River Basin because of the existing irrigation system. Most crop fields are furrow irrigated. Furrow irrigation consists of placing water in furrows and allowing the water to proceed downhill by gravity. When the water reaches the end of the field it is collected in a small ditch, which could direct it to a variety of places. Usually the water is returned to an irrigation ditch and reused by another farmer down the line. By the time the water is returned to the Malheur or the Snake River it has been used several times. The irrigation water can pick up sediment and other substances as it travels down the furrow. This effect is compounded when the water is reused several times as it is in the Malheur River Basin.

Objective

Control irrigation surface water return flows so they minimize adverse water quality impact on the stream into which they flow.

Resource Concern #3 - Riparian Area Management

Connection To Water Quality & Beneficial Uses Affected

Vegetation, both in the uplands and in the riparian area, plays a critical role in water quality. Generally, healthy plant communities:

- hold soil in place
- protect streambanks
- capture, store and safely release precipitation
- filter nutrients from both the groundwater and surface runoff, and
- provide shade to moderate water temperatures

In addition to the water quality benefits, healthy terrestrial vegetation contributes to improved fish habitat. Riparian vegetation protects spawning, rearing and holding areas by trapping sediment that could smother eggs and by improving the recruitment of large woody debris. This debris helps to create pools for fish to rest in, provides hiding cover and habitat diversity. Vegetation provides organic debris to feed aquatic insects, which are an essential element in the diets of many fish.
Riparian vegetation, consistent with site capability, is a cost effective means of reducing stream bank erosion and heating from solar radiation. It is important to note that research and practical examples have shown that land managers can maintain riparian health and conduct agricultural activities as well.

Performance Criteria - Critical Values
An effort to systematically assess current conditions and quantify vegetative site capability in the planning area will be done at a future date.
Technical criteria to determine attainment of this condition include but are not limited to:

1. Ongoing natural recruitment of riparian vegetation should be evident.
2. Management activities should minimize the degradation of established native vegetation.
3. Management activities should maintain at least 50% of each year's growth of woody vegetation - both trees and shrubs.
4. Management activities should be designed and installed to maintain streambank integrity through 25-year flood events.

Objective
Riparian vegetation to provide sufficient root mass for stream bank stability and shading to reduce the solar heating rate of surface water.

Resource Concern #4 - Streambank Stability

Connection To Water Quality & Beneficial Uses Affected
Stable streambanks reduce sedimentation and nutrient inputs into streams. They help moderate water temperatures because average water depth is greater, and banks in good condition provide cover and resting places for fish as well.

Performance Criteria - Critical Values
Bank stability assessment methods will be patterned after EPA or Rosgen monitoring protocols.

Objective
Riparian systems in healthy condition to withstand a 25-year event with minimal damage.

Resource Concern #5 -Rangeland and Pasture Management

Connection To Water Quality & Beneficial Uses Affected
Desirable upland native vegetation functions as a water trap and filter, where rain and snowmelt is captured and incorporated into the sub-surface soil layers. Any decline in range condition, as measured by the NRCS's site guides, affects water infiltration rates into the sub-soil where surface runoff may supersede infiltration. Reducing infiltration rates lead to damaging floods, erosion and lower late season flows. Although riparian areas are vital to water quality, they comprise only a small percentage of the landscape. It is important for water quality purposes to maintain and improve the condition of all vegetation in the watershed.

Performance Criteria - Critical Values

1. Plant community is neither dominated by invasive annual plant species nor by overgrowth of native woody species.
2. Plant cover (plants plus plant litter) is adequate to protect site
3. Distribution and amount of bare ground does not exceed what is expected for site
4. Livestock utilization patterns do not exhibit excessive sustained use in key areas
5. Plant vigor levels and regeneration are sufficient to protect long term site integrity

Objective
Protect and improve range conditions.

PROHIBITED CONDITIONS

Voluntary efforts are the focus of the ODA, the Malheur County SWCD and the Local Advisory Committee. However, situations may arise when a particular landowner refuses to take advantage of the voluntary compliance opportunities. In this case, the ODA must have a regulatory backstop to ensure pollution control. At the same time the ODA does not want to mandate or prohibit any specific agricultural activity. To maintain this flexibility, the Administrative Rules describe Prohibited Conditions which are as follows:

603-095-0940
Prohibited Conditions

(1) All landowners or operators conducting activities on lands in agricultural use shall comply with the following criteria. A landowner shall be responsible for only those conditions caused by agricultural activities conducted on land controlled by the landowner. A landowner is not responsible for prohibited conditions resulting from actions by another landowner. Conditions resulting from unusual weather events (equalling or exceeding a 25-year storm event) or other exceptional circumstances are not the responsibility of the landowner. Limited duration activities may be exempted from these conditions subject to prior approval by the department. The intent of these rules, in accordance with the Clean Water Act, is to protect clean water while also maintaining the economic viability of individual farming enterprises.

(2) Placement, Delivery, or Sloughing of Wastes: Effective upon adoption:

No person subject to these rules shall violate any provision of ORS 468B.025 or ORS 468B.050.

(3) Irrigation Surface Water Return Flow

(a) After January 1, 2006, irrigation surface water return flow to waters of the state shall not cause an excessive, systematic, or persistent increase in sediment levels already present in the receiving waters, except where the return flows do not cause the receiving waters to exceed established sediment standards.

(b) A landowner conducting irrigation activities in accordance with a plan approved in writing by the department or its designee shall be deemed to be in compliance with this rule.

(4) Active Streambank Erosion

(a) By January 1, 2006, no person may cause active streambank erosion beyond the level that would be anticipated from natural disturbances given existing hydrologic characteristics.

(5) Riparian Vegetation

(a) By January 1, 2006, no conditions are allowed that prevent the establishment and development of adequate riparian vegetation consistent with vegetative site capability to control water pollution by providing control of erosion, filtering of sediments, moderation of solar heating and infiltration of water into the soil profile.

(6) Range and Pasture Management

(a) By January 1, 2006, vegetative condition on rangelands and pasturelands shall be managed such that the functionality of the watershed is not impaired. Watershed function includes the ability of vegetation to filter sediment, utilize nutrients, control soil erosion, optimize infiltration of water to the soil profile, and minimize the rate and maximize the duration of runoff from precipitation.

(b) A landowner conducting range and pasture management activities in accordance with a plan approved in writing by the department or its designee shall be deemed to be in compliance with this rule.

Statutory Authority: ORS 568.909

Statutes Implemented: ORS 568.900 - 568.933

SCHEDULE FOR IMPLEMENTATION

The following is the schedule for implementing this plan:

A. Plan Period

Avoidance of Prohibited Conditions will be required within 5 years from the date of adoption of the OARs for the Malheur River Basin, during which time meaningful progress toward achievement of the stated objectives is anticipated.

B. Monitoring and Feedback

Monitoring shall begin upon approval and adoption of this plan.

C. Amendment

This plan and the associated administrative rules will be reviewed at two year intervals and amended as necessary.

MONITORING

A monitoring plan will be implemented to:

- Characterize baseline conditions:
    1. Existing water quality
    2. Prohibited land conditions
        - percent of eroding streambank on a named-tributary basis
    3. Site potentials of riparian vegetation throughout the Management Area. A map of site potentials will be created.
- Track Plan implementation
- Evaluate Plan effectiveness

With this knowledge, the LAC, the SWCD, and ODA will be able to refine and improve this plan in the coming years. We need the means to determine where our problems are and what we can do to correct them. This is part of our adaptive management strategy.

The Malheur River Basin Agricultural Water Quality Local Advisory Committee strongly expressed a desire to see more extensive analysis of existing data and collection of new data to more precisely determine agriculture's contribution to water quality problems in this subbasin. What follows is an outline of the monitoring and assessment process the Malheur County SWCD, with funding and cooperation from DEQ, ODA, and the Oregon Watershed Enhancement Board will conduct to address the LAC's concerns.

Existing Water Quality

1. Locate existing water quality data for the Malheur River Basin Agricultural Water Quality Management Area. Sources for existing information include the Malheur County SWCD, the local watershed council, DEQ, EPA, USDA Forest Service, and Bureau of Land Management.

2. Analyze existing data for trends in water quality, and for indications of background concentrations. Background concentrations can be determined by looking at chemical concentrations in water samples taken in areas upstream of any land development.

3. After identifying data gaps in the information collected, use a hierarchical design of sampling to focus at the watershed level. Secondary sites will be chosen to monitor potential contributing sources and to follow up on the effectiveness of adaptive management changes.

Land Condition Monitoring

1. Active Streambank Erosion

Several protocols exist to assess stream bank stability. One approach is the EPA monitoring protocol for bank stability after Platts, et al., (1983). Rosgen (1996) describes another method.

2. Placement, Delivery of Sloughing of Wastes

Initial monitoring for this Prohibited Condition will be visual inspection. If visual inspection discloses a potential problem, then an appropriate monitoring protocol may be selected to determine the extent of water pollution. The nature of the waste involved will determine which monitoring protocol is appropriate.

3. Irrigation Surface Water Return Flow

Turbidity at the site of return flow should be measured periodically to ensure that return flow turbidities do not exceed those of the stream into which the return flows.

4. Riparian Vegetation

Photographic records with a time sequence of photographs taken from the same point are the simplest method for qualitative assessments and for monitoring of trends. The greenline transect provides a more quantitative measurement of riparian vegetation. A protocol for mapping riparian vegetation site capability will be developed.

5. Nutrients

The current groundwater monitoring program should be continued.

Track Plan Implementation

- Track the reduction of soil erosion and water temperature from agricultural land in the basin
  - Improvement of bank stability
  - Improvement of riparian conditions
  - Improvement of nutrient, animal waste and irrigation management
- Promote landowner stewardship by encouraging the adoption of effective management practices
  - Track the number of effective management practices being used in the basin

- Increase public awareness and understanding of agriculture's contributions to improving water quality
  - Track the number of participants in outreach activities

- Pursue funding for private landowners to implement water quality improvement projects
  - Track the number of successful grant applications

Evaluate Plan Effectiveness

The ultimate measurement of success will be a continuation of the ongoing improvement of water quality in this basin. More work needs to be done to establish baseline data and determine if water quality can be improved. However, it must be recognized that in many areas the water quality is good now and probably can not get any better.

PUBLIC PARTICIPATION

The Director of the Oregon Department of Agriculture appointed an Malheur River Basin Water Quality Local Advisory Committee to represent:

- Local agricultural producers
- Local landowners
- Local environmental interests
- Local recreation interests
- Malheur County Soil and Water Conservation District

Their purpose was to help develop this plan and the associated draft of OARs. Committee meetings were held over a two year period. All meetings of the LAC were public meetings, were advertised in advance, and opportunity was given at each meeting for public input. In addition, the Department conducted a public hearing on August 29, 2000, and accepted written comment from August 1, 2000 to September 15, 2000.

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APPENDIX

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Table 1. Water Bodies in the Malheur River Basin on the 303(d) list

WATERBODY	BOUNDARIES	PARAMETER
Bear Creek	Mouth to Headwaters	Temperature
Big Creek	Mouth to Meadow Fork	Temperature
Bluebucket Creek	Mouth to Headwaters	Temperature
Bully Creek	Mouth to Bully Creek Res	Chlorophyll a
Bully Creek	Mouth to Bully Creek Res	Bacteria
Bully Creek	Bully Creek Res to Westfall	Bacteria
Crane Creek	Mouth to Little Crane Creek	Temperature
Elk Creek	Mouth to Headwaters	Temperature
Jacobsen Gulch	Mouth to Headwaters	Bacteria
Lake Creek	Mouth to Headwaters	Temperature
Little Crane Creek	Mouth to Headwaters	Temperature
Little Malheur River	Mouth to Headwaters	Temperature
Malheur River	Mouth to Hog Creek (Namorf)	Bacteria
Malheur River	Mouth to Hog Creek (Namorf)	Toxics
Malheur River, North Fork	Malheur River to Warm Springs Reservoir	Bacteria
Malheur River	Mouth to Hog Creek (Namorf)	Chlorophyll a
Malheur River	Warm Springs Reservoir to Wolf Creek	Flow Modification
Malheur River	Warm Springs Reservoir to Wolf Creek	Temperature
Malheur River	Wolf Creek to Headwaters	Temperature
Malheur River, North Fork	Mouth to Beulah Reservoir	Bacteria
Malheur River, North Fork	Beulah Reservoir to Crane Creek	Flow Modification
Malheur River, North Fork	Beulah Reservoir to Crane Creek	Temperature
Malheur River, North Fork	Crane Creek to Headwaters	Temperature
Pine Creek	Mouth to Alkali Creek	Temperature
Pole Creek	Mouth to Headwaters	Temperature
Sheep Creek	Mouth to Headwaters	Temperature
Shepard Gulch	Mouth to Headwaters	Bacteria
Stinkingwater Creek	Mouth to Headwaters	Temperature
Summit Creek	Mouth to Headwaters	Temperature
Swamp Creek	Mouth to Headwaters	Temperature
Willow Creek	Mouth to Pole Creek	Bacteria
Willow Creek	Mouth to Pole Creek	Chlorophyll a
Wolf Creek Mouth	Mouth to Headwaters	TemperatureT

Figure 1. 303(d) Listed Streams

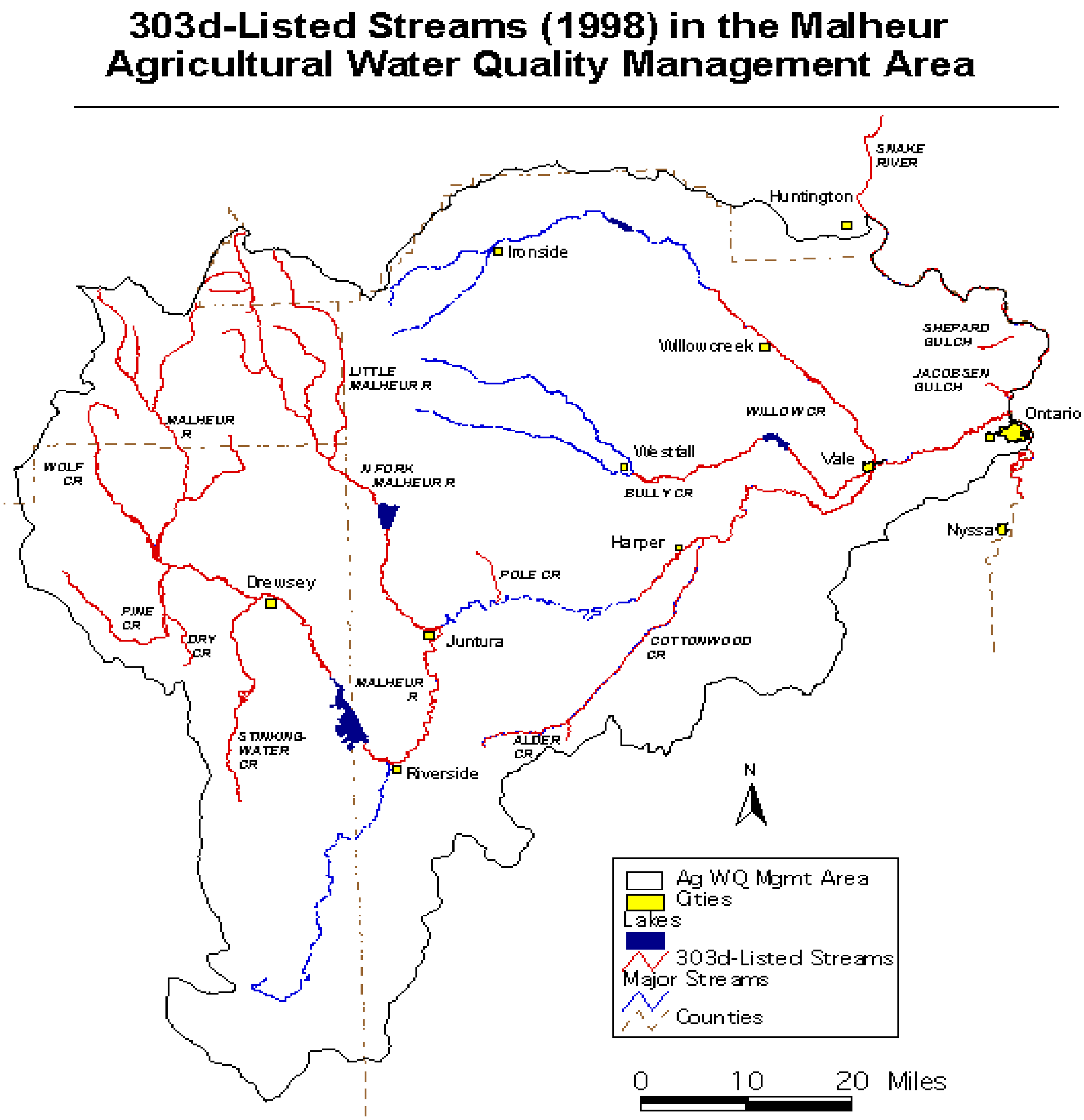

Figure 2. Malheur Agricultural Water Quality Management Area