

Upper Grande Ronde River Subbasin Agricultural Water Quality

MANAGEMENT AREA PLAN

GUIDANCE DOCUMENT

Developed by

**The Upper Grande Ronde River Subbasin Local Agricultural Water
Quality Advisory Committee**

with assistance from

**The Oregon Department of Agriculture
and
The Union County
Soil and Water Conservation District**

September 15, 1999

Local Advisory Committee Members

Dale Counsell, Chair	Ross Bingaman	David Axelrod
Rick George	Gene Hardy	Phil Hassenger
Gary Hathaway	William Howell	Dave Ricker
Maarten Tromp Van Holst	John Schiller	Paul Rudd

Foreword

This Agricultural Water Quality Management Area Plan (AWQMAP) provides guidance for addressing agricultural water quality issues in the Upper Grande Ronde subbasin. The purpose of this AWQMAP 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 AWQMAP do not, by themselves, establish legal requirements or prohibitions. The Oregon Department of Agriculture (the Department) will exercise its enforcement authority for the prevention and control of water pollution from agricultural activities under administrative rules for the Upper Grande Ronde subbasin Oregon Administrative Rules (OAR) 603-095-0400 through 603-095-0460, and OAR 603-090-0120 through 603-090-0180.

The OARs for the Upper Grande Ronde subbasin set forth the requirements and/or prohibitions that will be used by the Department in exercising its enforcement authority for the prevention and control of water pollution from agricultural activities. In addition, OAR 603-090-0120 through 603-090-0180 describe the enforcement actions that may be triggered upon the finding of a violation by the Department.

Within two years of adopting this plan the Department, the Union Soil and Water Conservation District (the District) and the Upper Grande Ronde Subbasin Water Quality Advisory Committee (the Committee) will assess the success of this plan and its associated rules. Based on these assessments, the Department, the State Board of Agriculture, the Committee and the District will consider making appropriate modifications of the plan and/or the associated OARs.

Table of Contents

MANAGEMENT AREA PLAN	1
GUIDANCE DOCUMENT	1
VISION, MISSION, AND GOALS	3
VISION	3
MISSION.....	3
GOALS	3
INTRODUCTION	4
GEOGRAPHIC AREA AND PHYSICAL SETTING.....	5
WATER QUALITY ISSUES	6
STRATEGIES FOR ACHIEVING GOALS.....	9
BEST MANAGEMENT PRACTICES.....	9
TEMPERATURE & AQUATIC HABITAT	10
SEDIMENT	10
BACTERIA	11
NITROGEN AND PHOSPHORUS (DISSOLVED OXYGEN AND PH)	11
FLOW MODIFICATION.....	11
VOLUNTARY MEASURES.....	11
VOLUNTARY WATER QUALITY FARM PLANS	12
UNDESIRABLE CONDITIONS	12
MONITORING.....	13
NUTRIENTS	14
EROSION	15
NON-CONFINED ANIMAL FEEDING OPERATIONS.....	15
ACHIEVEMENT OF GOALS.....	15
STRATEGIES TO ASSURE IMPLEMENTATION OF NECESSARY MEASURES	16
PUBLIC INVOLVEMENT	16
IMPLEMENTATION COSTS AND FUNDING SOURCES.....	17
RESPONSIBILITIES FOR PLAN IMPLEMENTATION	17
EVALUATION OF PROGRESS AND PLAN MODIFICATIONS.....	17
REFERENCES	18
STREAM TOPOGRAPHY.....	21
CROP MANAGEMENT.....	22
IRRIGATION.....	23
SOIL MANAGEMENT	25
GRAZING	26

APPENDIX B **31**

APPENDIX C **32**

THIS PAGE

LEFT BLANK

INTENTIONALLY

VISION, MISSION, AND GOALS

This is a plan created by the Upper Grande Ronde Subbasin Agricultural Water Quality Advisory Committee (the Committee), the Oregon Department of Agriculture (the Department), and the Union Soil and Water Conservation District (the District). The purpose of the plan is to prevent and control water pollution from agricultural activities and soil erosion in the Upper Grande Ronde Subbasin.

The Committee, the Department, and the District believe proper agricultural practices and widespread adoption of these practices will result in improved water quality. They also believe that ensuring the economic viability of agriculture is necessary to achieve this improvement in water quality. Achieving the goals in the plan, which includes maintaining the economic viability of agriculture, will lead to preserving and protecting beneficial uses.

This plan is part of an adaptive management strategy. Periodically the Department, the Committee, and the District will review this plan and revise it, if necessary, to ensure that we are achieving our mission and goals. Monitoring will play a key role in this adaptive management. For example, a good monitoring program will help us determine more precisely agriculture's role in water quality concerns in the Upper Grande Ronde Subbasin.

VISION

Maintain and/or improve the water quality of streams in the Upper Grande Ronde Subbasin.

MISSION

Maintain the economic viability of the agricultural industry, while pursuing ecological integrity through maintenance, restoration, education, and monitoring.

GOALS

- Protect economic viability
- Sustain and/or improve water quality by:
 - Reducing soil erosion from agricultural land in the basin
 - Improving bank stability
 - Improving riparian conditions
 - Improving nutrient, animal waste, and irrigation management
- Preserve private property rights
- Promote landowner stewardship by encouraging the adoption of best management practices
- Increase public awareness and understanding of agriculture's contributions to improving water quality through coordinated watershed outreach activities
- Pursue funding for private landowners to implement water quality improvement projects

- Participate in a monitoring program that:
 - Identifies current water quality conditions and assesses water quality trends
 - Assesses the implementation of the Senate Bill 1010 plan
 - Assists in delisting water quality limited streams in the Upper Grande Ronde Subbasin
 - Assesses compliance with the Undesirable Conditions outlined in this plan

INTRODUCTION

In 1972 the United States Congress passed and President Nixon signed the Clean Water Act into law. Since that time U.S. citizens have made great progress in cleaning and protecting their streams, rivers and lakes. However, much work remains.

Controlling and preventing pollution from point sources was the initial focus in the first years of implementing the Clean Water Act. Point sources are those types of pollution that come from one definable, easily recognizable and easily measurable spot. Water coming from a city's wastewater treatment plant outlet into a stream is one example of point source pollution.

Recently, the emphasis has shifted to preventing and controlling pollution from nonpoint sources. By its very nature, identifying the sources of nonpoint pollution is difficult. This is pollution that results from cumulative effects of past and present human activities on an entire watershed. Examples of nonpoint pollution are storm water runoff from urban areas, excessive erosion from logging and agricultural activities, and nutrients from poorly maintained septic tank systems.

In response to mounting concerns about water quality and how the state of Oregon was going to deal with them, the Oregon State Legislature passed Senate Bill 1010 in 1993. This law directs the Oregon Department of Agriculture to work with farmers and ranchers to develop Agricultural Water Quality Management Area Plans for basins with water quality problems. The plan that follows conforms to Senate Bill 1010 and the associated administrative rules.

As required by Senate Bill 1010, the Committee consisted primarily of landowners all residing in the subbasin. They were selected to represent the diverse aspects of the agricultural community in the Upper Grande Ronde Subbasin. Representatives of the environmental and recreational community and the Confederated Tribes of the Umatilla Indian Reservation were also part of the committee.

This plan encompasses all agricultural and rural lands in use, or where management has been deferred, or lying idle within the Upper Grande Ronde Subbasin. Activities subject to the Forest Practices Act are exempt. Provisions of this plan apply regardless of current productive agricultural use or profitability. Refer to Oregon Administrative Rules (OARs) [603-095-0010(4)] for the definition of agricultural use. Federal land managers will be responsible for water quality planning on their lands in the basin.

This agricultural water quality management plan addresses the following water quality issues and conditions related to lands in agricultural use:

- Erosion and surface water management
- Nutrient management
- Animal enterprises including Confined Animal Feeding Operations
- Near-stream management areas
- Livestock management

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

GEOGRAPHIC AREA AND PHYSICAL SETTING

The area included in this planning effort stretches from the headwaters of the Grande Ronde River to its confluence with the Wallowa River, a land area of 1,640 square miles. This plan will refer to this area as the Upper Grande Ronde Subbasin, which conforms to the U.S. Geological Survey's system of naming drainages.

The Grande Ronde River flows through the Blue Mountains. Topography within the Upper Grande Ronde Subbasin varies from rugged high elevation mountains to broad, nearly flat mountain-enclosed valleys. Elevations range from about 7,800 feet to slightly less than 2,300 feet. Average annual precipitation ranges from 12 - 25 inches below 3,000 feet to more than 50 inches above 5,000 feet. Typical summers are hot and dry, and winters tend to be cold and wet. Peak flows in the main stem of the Grande Ronde generally occur in April or May when mean monthly flows usually are around 2,000 cubic feet per second. August and September are months of low flow, and the mean monthly flows for these months is at or below 30 cubic feet per second.

Perhaps the most prominent physical feature in the planning area is the 360 square-mile Grande Ronde Valley. This valley is the heart of agricultural and urban activities in the subbasin. Farmers and ranchers use their land to grow wheat, grass seed, mint, alfalfa, livestock and several other crops. Many ranchers graze their livestock in the summer months on private and publicly owned lands in the mountainous regions of the subbasin.

Estimated 1996 income from crops, livestock and farm forestry in Union County was \$52,341,000. In terms of sales, the following crops were the most important:

- mint
- wood products
- cattle and calves
- grains
- grass and legume seeds

WATER QUALITY ISSUES

Oregon's Department of Environmental Quality (DEQ) is responsible for determining which bodies of water are "water quality limited" under section 303 (d) (1) of the Clean Water Act. Many of the streams in the Upper Grande Ronde Basin do not meet standards for one or more of the following seven factors:

- Dissolved oxygen
- pH
- Sediment
- Temperature
- Bacteria
- Aquatic habitat modification
- Flow modification

DEQ has set Total Maximum Daily Loads for nitrogen and phosphorus for the Upper Grande Ronde Subbasin as well. This was done because excess levels of nutrients spur algae growth, which is the main cause of the dissolved oxygen and pH problems in the subbasin.

DEQ has determined that cold-water fish species are the most sensitive beneficial use not being adequately supported in the Grande Ronde. Spring/summer chinook salmon, summer steelhead, bull trout, rainbow trout and brook trout are some of the cold-water fish species that use the Upper Grande Ronde Subbasin for all or part of their life cycles.

Many agencies and groups have been collecting water quality data in the Grande Ronde Subbasin for several years. These data indicate that nonpoint source pollution contributes to water quality problems. For example, water quality problems begin upstream from the La Grande wastewater discharge point and persist well below both the La Grande and Union discharges.

Nonpoint source pollution is the result of many human activities that occur in a basin. Effects from poor land management, while having a small influence on water quality locally, can accumulate and become significant problems at the watershed level. The opposite is true as well. Sound management may have only a small local effect, but broadly applied practices will lead, in time, to significant improvements overall. For these reasons this management area plan will apply uniformly to all agricultural and rural lands in the subbasin. It is also important to treat all landowners in the planning area as fairly as possible.

Vegetation, both in the uplands and in the riparian area, plays a critical role in water quality. Extensive research conducted in eastern Oregon and throughout the west confirms this. Generally, healthy plant communities:

- hold soil in place
- protect stream banks
- capture, store and safely release precipitation
- filter nutrients from both the ground water and surface runoff

- provide shade to moderate water temperatures

In addition to the water quality benefits, healthy terrestrial vegetation improves fish habitat. Riparian vegetation protects spawning, rearing and holding areas by trapping sediment that could smother eggs and 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. These insects are an essential element in the diets of many fish.

Out of 70 stream segments in the subbasin, 36 are on the 303 (d) list because their temperatures exceed the water quality standards. Water temperatures affect most aspects of an aquatic environment. Research has shown that temperatures as high as 77 degrees F can be lethal to chinook salmon and steelhead if they are exposed to these temperatures for several hours. Temperatures of 70 degrees F can cause 50 percent mortality, and water less than 70 degrees F can still cause the fish problems. These sub-lethal temperatures can reduce growth, increase susceptibility to disease and increase competition from warm-water species.

Many factors influence stream temperatures. Some of the most important factors are:

- volume of water flowing in the stream
- width-to-depth ratio of the stream
- ground water recharge
- shade

Vegetation affects all these factors. Riparian vegetation can help narrow and deepen stream channels, which protects water from heating by exposing less stream surface area to the surrounding environment. Healthy vegetation in both the uplands and in the riparian area will capture, store and safely release water later in the season. Releasing water later in the summer will reduce temperatures in two ways. The first way is that a higher volume of water requires more energy to heat it. Secondly, infusion of ground water, usually between 45 and 55 degrees F, can help hold down stream temperatures.

Shade, provided by tall vegetation, blocks solar radiation, and solar radiation is the single most important energy source for heating streams during daytime conditions (Beschta, 1997). Thus streamside vegetation, via the shade it produces, moderates summertime stream temperatures.

Clearly restoring healthy, functioning vegetation communities, especially riparian vegetation, will improve critical fish habitat necessary to support the three endangered fish species in this subbasin.

Some general categories related to agriculture that could influence water quality are:

- Soil management
- Nutrient application
- Animal manure management
- Livestock management
- Near stream management

Clearly agricultural activities do not cause all water quality problems in the Grande Ronde. For example, the city wastewater discharges are an important source of nutrients. Storm water runoff from the urban areas contributes nutrients as do poorly maintained septic tanks. Poorly maintained roads and bridges increase sediment loads in streams and rivers. Forestry activities can cause increases in stream temperatures, as well as sediment and nutrient concentrations in stream water. Many other activities not listed here can also influence water quality. Other factors besides human management influence water quality. The geology of the subbasin influences both surface and ground water quality. For example, the highly alkaline soils found in the subbasin can increase the pH of surface and ground water. This is especially true in the southern end of the subbasin, and in the portion of Catherine Creek downstream from the town of Union.

The climate and topography of the subbasin also have a profound influence on water quality. Because the Grande Ronde River originates in low elevation mountains, and eastern Oregon's climate is hot and dry, water temperatures are naturally high and flows are low late in the summer. Low flows concentrate nutrient levels, which along with high temperatures, increase algae growth. Excessive algae growth is the main cause of the observed dissolved oxygen and pH fluctuations.

One way of correcting low late season flows is to build multipurpose reservoirs. These reservoirs could capture spring runoff and augment flows for instream purposes during the dry season. As stated earlier, a higher volume of water requires more energy to heat. Higher flows could also help dilute the nutrient concentrations, thereby reducing the pH and dissolved oxygen problems in the Grande Ronde Valley. Another aspect that multipurpose reservoirs could help would be in controlling flooding in the valley. Many areas flood frequently in the spring, causing extensive damage to stream banks. This damage contributes to sedimentation problems, the nutrients bound to the sediment contribute to pH and dissolved oxygen problems, and the flooding can destroy existing riparian vegetation and impede the establishment of new vegetation.

In the past, several agencies have studied the feasibility of building reservoirs and have developed plans to do so. The limiting factor has been protecting the salmon and steelhead runs in the basin. Among the options available that could protect the runs and store water is to build off-channel reservoirs or small dams on several tributaries of the Grande Ronde and Catherine Creek Rivers. A study conducted by the Bureau of Reclamation (USDI - Bureau of Reclamation, 1981) identified 40 potential dam sites on tributaries in the headwaters of these two rivers. The Bureau estimated that at least 20 small dams are needed to control a 10-year flood event (Grande Ronde Cooperative River Basin Study, 1996).

Recently the Department applied for and was granted a water reservation for the purposes of storing water in the Upper Grande Ronde Subbasin. The details of this reservation are found in the Water Resources Department's Administrative Rules (OARs 690-508-110). The priority date of the reservation is November 6, 1992. The quantity and source of the reserved water are as follows:

- 14,900 acre-feet of Meadow Creek and its tributaries
- 12,000 acre-feet of the Grande Ronde River upstream of river mile 184
- 9,000 acre-feet of Catherine Creek above Ames Creek

If the Water Resources Department does not receive applications for these reservoirs by February 7, 2017, the water reservations will be repealed.

Another factor influencing current water quality is past management practices. One example is the State Ditch. This ditch captures the Grande Ronde River just downstream from Island City. It has changed what historically was 33 miles of meandering river channel. Most of this old river channel is now supplied with water only from Catherine Creek. The part of the old channel the State Ditch cut off is now farmed and houses and barns have been built in its path. Under this water quality plan we will assume that the State Ditch will remain intact.

It should be noted that landowners and agencies have implemented many practices and completed many projects to benefit water quality in this basin. Implementation of this plan will encourage this work to continue and to expand. Water quality can only improve as a result.

STRATEGIES FOR ACHIEVING GOALS

Providing information, education, technical assistance, and grant writing assistance to landowners is the primary way the Department and the District plan to improve water quality in the subbasin. The District, acting as the Local Management Agency, will be the lead organization responsible for implementing this strategy of education and assistance.

In addition to the voluntary strategies listed above, this plan includes regulatory backstops as directed by Senate Bill 1010. The Department will use these regulatory mechanisms where appropriate and necessary to gain compliance, and the Department will take enforcement actions only when reasonable attempts at voluntary solutions have failed.

To emphasize what strategies the Department and the District will use to implement this plan, the following items will be discussed in detail:

- Best Management Practices
- Voluntary Water Quality Farm Plans
- Undesirable Conditions

BEST MANAGEMENT PRACTICES

Agricultural Best Management Practices (BMPs) for the Upper Grande Ronde Subbasin are those management practices that are generally accepted as the most effective, economical and practical for the area, and they address water quality issues. These practices should also maintain the economic viability of agriculture in the subbasin.

Appropriate management practices for individual farms and ranches may vary with the specific cropping, topographical, environmental and economic conditions that exist at a given site.

Because of these variables it is not possible to recommend any uniform Best Management Practices for farms or ranches in the Upper Grande Ronde Subbasin. However, the Committee discussed a variety of practices, which based on their experience are appropriate for this subbasin. The Natural Resources Conservation Service's (NRCS) Field Office Technical Guide contains extensive lists of Best Management Practices as well.

The worksheets in Appendix A capture the Committee's discussions. Please refer to these pages to learn more details about the Committee's thoughts on BMPs. These worksheets are intended to increase awareness and provide information and education to the general public and the agricultural community. They are not intended to be mandates to farmers. Senate Bill 1010 was designed to maintain as much flexibility in farming and ranching as possible.

What follows is a summary of some of the practices that the Department, District, and the Committee will encourage landowners to adopt, if they have not already. Widespread adoption of these practices will address the water quality parameters of concern in the Grande Ronde River. The management practices are grouped by the water quality issues they influence.

TEMPERATURE & AQUATIC HABITAT

- Near Stream Management Area Practices
 - Critical Area Planting where appropriate
 - Improve livestock management and distribution through:
 1. Riparian pastures as part of a rotational grazing scheme
 2. Off-stream water development
 3. Salting
 4. Herding
 5. Fencing where appropriate
 6. Improved management of big game herds

SEDIMENT

- Improve bank stability
 - Critical Area Planting where appropriate
 - Install rock barbs and rip-rap where appropriate
 - Bank shaping where appropriate
 - Improve riparian grazing management
 - Rock water gaps and animal crossings
- Ag field erosion
 - Plant buffer strips
 - Use grass waterways
 - Plant perennial crops
 - Use conservation tillage where appropriate
 - Use sediment traps
 - Install terraces and diversion ditches
 - Plant windbreaks to control wind erosion

BACTERIA

- Animal waste management
 - Plant buffer zones
 - Install settling ponds
 - Install “clean water diversions” around livestock concentration areas

NITROGEN AND PHOSPHORUS (DISSOLVED OXYGEN AND PH)

- Fertilizer management
 - Encourage soil and foliage testing
 - Plant buffer strips to filter nutrients
- Bank Stability and field erosion
 - Plant buffer strips
 - See Sediment Section

FLOW MODIFICATION

- Irrigation Management
 - Improve irrigation efficiency by:
 1. Pump testing
 2. Sizing mainlines properly
 3. Use proper nozzle sizes
 4. Fix leaks
 5. Install headgates at diversion points and/or improve existing structures
 6. Conversion of surface systems to buried mainline
 7. Monitor soil moisture levels
 8. Line or pipe irrigation ditches
- Alternative water for irrigation
 - Use city wastewater
 - Use deep well water when feasible

VOLUNTARY MEASURES

Voluntary efforts of individual landowners will be the primary means of preventing and controlling nonpoint source pollution from agricultural and rural lands in the Upper Grande Ronde Subbasin. Local, state, and federal agencies will assist by providing information, educational opportunities, technical and financial assistance. Both the District and the Department believe this will be the most effective means to improve water quality. To determine the success of this plan, the District and the Department will participate in a monitoring program.

VOLUNTARY WATER QUALITY FARM PLANS

In keeping with the spirit of voluntary cooperation, the District will encourage landowners to develop individual farm plans to address water quality. Land managers will develop these plans to help them make decisions about applying BMPs that will conserve soil, water, plant and animal resources. These plans will outline specific measures necessary to prevent and control water pollution. Depending on the operation and the specific site, they may contain any or all of the following elements:

- Erosion Control
- Nutrient Management
- Irrigation Management
- Animal Manure Management
- Livestock Management
- Near-stream Management

Voluntary Water Quality Farm Plans (VWQFPs) may be drawn up by landowners or operators, or by consultants or technicians working for the District. These individual plans will be consistent with this basin-wide plan. The District will review and approve these plans in concert with the Department.

UNDESIRABLE CONDITIONS

All landowners or operators who conduct activities on agricultural lands shall be in compliance with the following criteria. A land occupier shall be responsible for only those conditions caused by activities conducted on land managed by the landowner or occupier. Criteria do not apply to conditions resulting from unusual weather events or other exceptional circumstances which could not have been reasonably anticipated. The Department, in consultation with the District, the County Committee and NRCS, will determine if unusual weather or other exceptional circumstances apply. In addition, activities related to construction, restoration or maintenance may be exempted from the prohibitions related to these conditions.

Upon adoption of OARs 603-095-0400 through 603-095-0460 formalizing specific requirements of this plan, the following conditions will not be allowed:

- Waste discharges: Effective upon rule adoption:
 - (a) No person conducting agricultural land management or earth disturbing practices shall 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 waters of the state by any means.
 - (b) No person conducting agricultural land management or earth disturbing practices shall discharge any wastes into any waters of the state if the discharge reduces the quality of

such waters below the water quality standards established by rule by the Environmental Quality Commission.

(c) No person conducting agricultural land management or earth disturbing practices shall violate the conditions of any waste discharge permit issued pursuant to ORS 468B or ORS 568.

- Soil erosion: By January 1, 2003

(a) No agricultural land management or soil disturbing activity shall cause sheet or rill erosion in excess of the tolerable soil loss "T" for the subject field, and no Agricultural land management or soil disturbing activity shall cause active channel erosion that delivers sediment directly into the waters of the state.

(b) An alternative standard, approved by the Department, that assures protection of water quality.

(c) No discharge of sediment to the waters of the state in excess of water quality standards.

- By January 1, 2003, no agricultural land management or soil disturbing activity shall cause streambanks to breakdown, erode, tension-crack, shear or slump beyond the level that would be anticipated from natural disturbances given existing hydrologic characteristics. (Nutrients, sediment, aquatic habitat).

- By January 1, 2003, nutrient application rates and timing shall not exceed specific crop requirements. Crop requirements will be based on recommendations from the best available data applicable to a specific site. (Nutrients).

- By January 1, 2003, construction and maintenance of surface drainage field ditches shall not result in sediment delivery to waters of the state from soil erosion caused by excessive channel slope, unstable channel cross-section or placement of disposed soils. (Nutrients, sediment, aquatic habitat).

- By January 1, 2003, agricultural activities shall allow the development of riparian vegetation to control water pollution by providing control of erosion, filtering of sediments and nutrients, moderation of solar heating and infiltration of water into the soil profile. Evaluation of riparian vegetation development will consider site specific capabilities and anticipated levels of natural disturbance. Where cropping or resource protection activities have occurred, an adequate vegetative buffer or equally effective pollution control practice must be in place. (Nutrients, sediment, aquatic habitat, temperature).

MONITORING

Monitoring is a critical part of this water quality management plan. A good monitoring program will enable local land managers and agencies to determine the following factors:

- Current conditions
- Agriculture's contribution to water quality problems
- Effectiveness of management practices
- Effectiveness of this management plan

With this knowledge, the Committee, the District, and the Department 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.

In the Upper Grande Ronde subbasin, DEQ, the District, the U.S. Forest Service, and others have collected a great deal of water quality information in the last 10 years. The 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 District, with funding and cooperation from the DEQ, the Department, the Grande Ronde Model Watershed Program, the U.S. Forest Service, and the Governor's Watershed Enhancement Board, will conduct to address the committee's concerns.

NUTRIENTS

Potential nutrient loss varies greatly from site to site because of differing soil properties and other factors. Using existing information and resources, the monitoring program will assess the relative vulnerability of sites throughout the subbasin for nutrient loss using some of the following information:

- Soil erosion potential
- Site runoff class
- Current land use information

To better understand agriculture's contribution to water quality problems, if any, agencies currently collecting data need to expand their programs. Some examples of new activities are as follows:

- Sample water from irrigation ditches, drain tiles and drainage ditches
- Set up a limited network of shallow groundwater sampling wells
- Correlate this information with land uses, soil properties and other factors

The agencies, in cooperation with landowners, need to implement more intensive "nutrient budget" demonstration project. A nutrient budget would entail among other things:

- Measuring the ground water before it passes under a field and after it leaves
- Soil nutrient sampling
- Nutrient analysis of irrigation water and natural precipitation
- Nutrient analysis of the agricultural crop

If done properly on a variety of soil and crop combinations, these projects can help assess agriculture's contribution and assess management practices.

EROSION

Agencies need to inventory and rank soil types on their potential to contribute sediment to the waters of the state in the Upper Grande Ronde Subbasin. This inventory will help determine agriculture's potential contribution to water quality problems. This process should incorporate at least the following items:

- Erodibility of soils
- Bank erosion
- Slope
- Length of slope
- Presence and nature of cover

NON-CONFINED ANIMAL FEEDING OPERATIONS

Livestock operations not subject to Confined Animal Feeding Operation permits are a potential source of nutrients, sediment, and bacteria. This is an instance where several "nutrient budget" demonstration projects could help identify agriculture's potential contribution to water quality problems. As with the suggested demonstration projects in the Nutrient section, these projects would monitor all sources of water entering and leaving winter feeding grounds, for example. Land managers could conduct several of these projects on several different soil types and topographical situations. After implementing these projects and inventory of these kinds of operations could further help clarify the situation in the subbasin.

ACHIEVEMENT OF GOALS

An important part of the monitoring program is tracking the achievement of the goals of this plan. What follows is an outline of how this will be done.

- Protect economic viability
 - Track costs/benefits of implementation of management practices
- Sustain and/or improve water quality
- Track the reduction of soil erosion from agricultural lands in the basin
 - Improvement of bank stability
 - Improvement of riparian conditions
 - Improvement of nutrient, animal waste and irrigation management
- Promote landowners stewardship by encouraging the adoption of best management practices

- Track the number of best 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

STRATEGIES TO ASSURE IMPLEMENTATION OF NECESSARY MEASURES

The Department and the District will encourage participation in this water quality improvement program by:

- Providing educational programs to raise public awareness and understanding of water quality issues and solutions
- Offering technical assistance for the development and implementation of Voluntary Water Quality Farm Plans
- Assessing agriculture's contribution to water quality problems through monitoring
- Pursuing water quality complaints
- Verifying the existence of prohibited conditions based on complaints and/or inventory and survey information
- Taking appropriate enforcement actions as outlined in Oregon Administrative Rules 603-090-0060 through 603-090-0120 when the Department has determined that prohibited conditions exist.

PUBLIC INVOLVEMENT

The director of the Department appointed an Upper Grande Ronde Subbasin Water Quality Advisory Committee (the Committee) to represent:

- Local agricultural producers
- Local landowners
- Local environmental interests
- Local recreation interests
- Tribal interests
- Union 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 Committee were public meetings, were advertised in advance, and opportunity was given at each meeting for public input. In addition, a public hearing and comment period was held in April and May 1999.

IMPLEMENTATION COSTS AND FUNDING SOURCES

A variety of funding sources are available to private landowners to assist in implementing water quality enhancing practices. Some examples are as follows:

- The Governor's Watershed Enhancement Board
- Bonneville Power Administration through the Grande Ronde Model Watershed Program
- Oregon Department of Fish and Wildlife's Access and Habitat Program
- NRCS programs (e.g. EQUIP, WHIP, WRP and others)

RESPONSIBILITIES FOR PLAN IMPLEMENTATION

The District, acting as the Local Management Agency, will be responsible for day-to-day implementation of this plan. This will consist of providing information, education, technical assistance and grant writing assistance to local land owners.

The Department will be responsible for any activities related to determination of violations of prohibited conditions, or enforcement as outlined in the applicable rules, OAR 603-090-0060 through 603-090-0120.

EVALUATION OF PROGRESS AND PLAN MODIFICATIONS

The monitoring program described in this plan will be the main way agencies and landowners will measure their progress. This will include:

- Continuing and expanding monitoring programs
- Compiling and analyzing existing data to conduct trend analyses
- Inventory and assessment of current management activities

Within two years of adopting this plan the Department, the District and the Committee will assess the following factors:

- An assessment of agriculture's contribution to water quality problems
- Identification of remaining contributing sources to water pollution
- The number of new BMPs being implemented
- The number of farms operating under approved VWQFPs

Based on these assessments, the Department, the State Board of Agriculture, the Committee, and the District will consider making appropriate modifications of the plan and/or the associated OARS.

REFERENCES

Beschta, R.L. 1997. Riparian shade and stream temperature: An alternative perspective.
Rangelands 19(2): 25-28

Grande Ronde Cooperative River Basin Study, Union County Oregon. 1996

USDI – Bureau of Reclamation. 1981. Grande Ronde River Basin, Oregon: Appraisal Report.

APPENDIX A

**RESOURCES ISSUE
WORKSHEETS**

**THIS PAGE
LEFT BLANK
INTENTIONALLY**

STREAM TOPOGRAPHY

Needs	Recommended Practices	Done by Whom
Bank Stability		
Reasonably stable banks are important for agricultural production and water quality for several reasons	Pursue Multipurpose Upstream Storage – could control peak flows which can cause some of the excessive erosion seen in the valley. Storing some of the peak flows could provide water to increase late summer and early fall flows	-Landowners -Advocacy groups -ODA
-protect structures (protect Dale’s barn for example)	Restoration of stream bank and channel. See Bureau of Reclamation’s report for the Imbler Floodplain Management group. Contact Union SWCD for a copy. -Critical area planting where conditions permit -Barbs and rip-rap where appropriate -Bank shaping/sloping where appropriate -Dike set backs combined with vegetation restoration can increase carrying capacity of the river and trap sediments, filter nutrients and prevent erosion.	NRCS*, SWCD, OSU Ext. ODFW, GRMWP –tech. Assist. and some financial assist. SWCD, ODA- information and education Landowners – riparian area management
-protect productive ag fields from flooding and channel changes	See stream bank and channel restoration.	see Protecting Structures
-excessive erosion contributes to high sediment loads	See stream bank and channel restoration.	see Protecting Structures
-erosion is one of the main ways excessive levels of phosphorus enter streams and rivers. Research suggests 60-90% of phosphorus enters streams this way.	See stream bank and channel restoration.	see Protecting Structures
Lack of vegetation reduces bank stability. Plant roots can do a good job of holding soil in place.	Critical area planting where conditions permit.	see Protecting Structures

STREAM TOPOGRAPHY

Needs	Recommended Practices	Done by Whom
Ice flows combined with natural and artificial blockages can cause bank scouring and erosion even with vegetation in place.	Modify blockages such as bridges and culverts, if possible, to prevent ice jam buildups. Important to assess structures frequently.	see Protecting Structures
A river's tendency to meander, especially in flat valleys like the Grande Ronde.	See stream bank and channel restoration. It is important to inform the public about stream dynamics (one example is the Proper Functioning Condition assessment methods).	see Protecting Structures
Livestock/wildlife disturbing the banks	Create opportunities for animal control through off-stream water, fencing, rocking water gaps among many other practices. Provide input to ODFW on big game issues.	see Protecting Structures

*Note Appendix B for an explanation of abbreviations.

CROP MANAGEMENT

Needs	Recommended Practices	Done by Whom
Nutrient management	<ul style="list-style-type: none"> • Encourage soil and foliage testing to determine proper nutrient application needs • Increase operator awareness of crop nutrient needs through educational outreach 	NRCS, SWCD, extension, ODFW, GRMWP, crop consultants Tech. Assist. SWCD, ODA – information and education Landowners – management

IRRIGATION

Needs	Recommended Practices	Done by Whom
More water	<ul style="list-style-type: none"> • Pursue upstream structural storage • Increase the quantity of late-season water if conditions upstream improve. We can accomplish this through better forest, grazing, road and recreation management. 	Storage: WRD, Landowners, ODA Management: Landowners, US Forest Service
Improve efficiency of the use of available water for irrigation	<ul style="list-style-type: none"> • Recognizing that crop water needs are a complex issue, irrigation timing could be done by monitoring soil moisture (no over or under application of water). OSU Extension is currently testing this idea here in the Grande Ronde. • With the conversion to sprinkler irrigation, it should be recognized that farmers are not too far from peak efficiency already. 	Education – SWCD, ODA, OSU Extension, WRD, others Management - Landowners
Delivery system efficiency	<p>Efficiency can be improved by doing some of the following things:</p> <ul style="list-style-type: none"> • pump testing • sizing mainlines properly • using proper nozzle size • fixing leaks • installing headgates at diversion points • improve existing diversion structures • conversion of surface systems to buried main lines (bring back ACP cost share. Can EQIP dollars pay for this? Yes) • line or pipe water through irrigation ditches <p>Concerns: Costs are prohibitive for most ditch companies to do this. Public funds are not available. However, landowners have concerns about the government requiring in-stream rights as a condition for using public money. A possible solution may be the Conserve Water Statutes that allow for increased water for both irrigators and streams.</p>	Education – SWCD, ODA, OSU Extension, WRD, others Management - Landowners

Irrigation

Needs	Recommended Practices	Done by Whom
Erosion from irrigation	Erosion from irrigation can be reduced by: <ul style="list-style-type: none"> • managing irrigation so that you eliminate surface runoff • use settling ponds where appropriate • buffer strips to catch sediment and prevent erosion (among other things) 	Education – SWCD, ODA, OSU Extension, WRD, others Management - Landowners
Explore alternate sources of water	<ul style="list-style-type: none"> • Some farmers could use the effluent from the cities of Union and La Grande sewage treatment plants. • Where it is economically feasible, some farmers could convert from surface sources to deep well water. • Concerns with this option: <ul style="list-style-type: none"> - Is there overuse of the ground water resource? Plenty of water available now, but how long is it going to be there? - Preliminary studies show some evidence of deep groundwater recharge. A study continues of the area's geology. The results of this study will help us understand these aquifers better. 	Education – SWCD, ODA, OSU Extension, WRD, others Management - Landowners
Recognition that irrigation is listed as a beneficial use of water. Additionally, it must be recognized that water enhances the profitability and value of the land.	The agricultural community and agencies need to educate the public about this fact.	

SOIL MANAGEMENT

Needs	Recommended Practices	Done by Whom
Erosion		
Minimize bare soil	<ul style="list-style-type: none"> • Plant buffer strips around edges of fields and near waterways • Grass and sod waterways to stabilize banks • Plan perennial crops to build soil and provide ground cover year round • Install runoff/settling ponds to trap sediment coming off fields • For crops such as winter wheat, early fall planting will help to minimize water and wind erosion • Employ conservation tillage techniques where appropriate to reduce soil disturbance • Install diversion ditches and terraces to reduce surface runoff 	<p>NRCS, SWCD, OSU Extension, ODFW, GRMWP – Tech Assist.</p> <p>Landowners –Implement management</p>
Improve upland conditions	<ul style="list-style-type: none"> • Utilize sound grazing management. Encourage landowners to develop grazing management plans. • Prevent and control the spread of noxious weeds. 	<p>NRCS, SWCD, OSU Extension, ODFW, GRMWP – Tech Assist.</p> <p>Landowners –Implement management</p>

GRAZING

Needs	Recommended Practices	Done by Whom
Improved Livestock Management and Distribution	Fencing, cross-fencing, water development, salting, herding, and rotational grazing are all potential solutions, but it must be recognized that each situation is different. Landowner education is the key.	SWCD, OSU Extension, ODA – education NRCS – tech. assist Landowners – management
Efficient Use of Resources (vegetation) - avoid over and/or under utilization of vegetation	See Actions for Improved Livestock Management and Distribution	SWCD, OSU Extension, ODA – education NRCS – tech. assist Landowners – management
Uniform and consistent protocols for utilization monitoring on Forest Service and private lands	Pursue improved protocols and once they are established, promote private landowners using them on their own lands.	USFS, OSU Range Department. Landowners
Controlling Noxious Weeds	Use herbicides, biological controls and proper grazing management for prevention and control of weed invasions	SWCD and ODA County, Tri-County wee board – education NRCS – tech assist. Landowners – management
Maintain economic viability by protecting grazing opportunities	Educating landowners Manage grazing to a certain stubble height to control the vegetation composition in riparian areas.	

GRAZING

Needs	Recommended Practices	Done by Whom
<p>Address habitat degradation by wildlife</p> <p>Big game can cause damage in a number of ways. Among them are:</p> <ul style="list-style-type: none"> -trampling and soil compaction during the wet season -heavy grazing at inappropriate times -disturbance to riparian areas, especially shrub browsing <p>Not only does this damage hurt the landowner's farming and ranching operations, but they are concerned their livestock will be blamed for this damage. Land owners cannot control this situation. big game forage usage could also make it impossible to meet some of the utilization standards on some public lands.</p>	<p>Provide landowner input to ODFW on big game management</p> <p>Educate landowners about programs available to manage big game on their property</p> <ul style="list-style-type: none"> -compensation for damage by wildlife 	<p>Landowners and ODFW</p>
<p>Riparian area grazing</p>	<p>Manage as appropriate to maintain desirable vegetation composition.</p> <p>It should be recognized that in areas such as the Grande Ronde Valley, allowing grazing in riparian areas might be better for water quality than cropping right to the stream's edge. In other words, if grazing is not allowed, well vegetated pastures might be plowed.</p> <p>Establish riparian pastures</p> <p>Use grazing as a tool. With proper timing and intensity of grazing woody vegetation in riparian areas can increase with time. An example is the Hall Ranch on Catherine Creek.</p> <p>See Actions for Improved Distribution and Control.</p>	<p>SWCD, OSU Extension, ODA – education NRCS – tech. assist Landowners – management</p>

GRAZING

Needs	Recommended Practices	Done by Whom
Rangeland Restoration	<p>Must control noxious weeds. See Actions for Noxious Weed Control Section</p> <p>Rangeland seeding can be very beneficial.</p> <p>Proper management and utilization can go a long way to restore rangeland. See Actions for Livestock Control.</p> <p>Landowner education and management is the key.</p>	<p>SWCD, OSU Extension, ODA – education NRCS – tech. assist Landowners – management</p>
<p>Winter Feeding</p> <p>-runoff management – prevent animal wastes from running directly into creek</p>	<p>-grass buffer zones can work. These zones can also be grazed in the summer. Divert runoff so that water runs through vegetation to filter nutrients and bacteria. Settling ponds work well. Land Managers should also consider clean water diversions. That is, divert water before it goes through feeding areas. Lot surface maintenance, such as scraping or mounding, will improve things as well.</p>	<p>SWCD, OSU Extension, ODA – education NRCS – tech. assist Landowners – management</p>
-noxious weeds from hay	-feed weedless hay	
-trampling and compaction of streambanks resulting from cows going to creek for water	<p>-rock water gaps to prevent erosion.</p> <p>-Provide off-stream water.</p>	<p>SWCD, OSU Extension, ODA – education NRCS – tech. assist Landowners – management</p>
-trampling and compaction of pastures from having cows and wildlife on field during wet times of the year.	-rotate where cattle are fed.	<p>SWCD, OSU Extension, ODA – education NRCS – tech. assist Landowners – management</p>

GRAZING

Needs	Recommended Practices	Done by Whom
-waste management is especially critical for “small feedlot” area	See Actions for the Runoff management section. Again education is the key along with financial assistance.	SWCD, OSU Extension, ODA – education NRCS – tech. assist Landowners – management
Grazing on Small Hobby Farms -noxious weeds are a large problem on these lands.	Education and outreach are critical for progress to be made. Need to explore new avenues to reach these landowners. some possible ways are through the local schools and through programs put on by local veterinarians and horse clubs.	SWCD, OSU Extension, ODA – education NRCS – tech. assist Landowners – management

**THIS PAGE
LEFT BLANK
INTENTIONALLY**

APPENDIX B

LIST OF ABBREVIATIONS

BPA – Bonneville Power Administration

DEQ – Department of Environmental Quality

GRMWP – Grande Ronde Model Watershed Program

GWEB – Governor’s Watershed Enhancement Board

NRCS – Natural Resources Conservation Service

ODA – Oregon Department of Agriculture

ODFW – Oregon Department of Fish and Wildlife

OSU Ext. – Oregon State University Extension Service

USFS – United States Forest Service

USWCD – Union Soil and Water Conservation District

WRD – Water Resources Department

**THIS PAGE
LEFT BLANK
INTENTIONALLY**

APPENDIX C

DEFINITIONS

Waste

Sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances which will or may cause pollution or tend to cause pollution of any waters of the state. ORS 468B.005(7)

Pollution or Water Pollution

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 habitat thereof.

Active Channel Erosion

Gullies or channels which at the largest dimension have a cross sectional area of at least one square foot and which occur at the same location for two or more consecutive years. OAR 603-095-0010(1).

Surface Drainage Field Ditch

A graded ditch for collecting excess water in a field. OAR 603-095-0010(47)

Riparian Vegetation

Plant communities consisting of plants dependent upon or tolerant of the presence of water near the ground surface for at least part of the year. OAR 603-095-0010(36).