CHAPTER 7
UMPQUA BASIN
WATER QUALITY MANAGEMENT PLAN
(WQMP)

Prepared by: Oregon Department of Environmental Quality

Submissions by:

Oregon Department of Agriculture
Oregon Department of Forest
Oregon Department of Transportation
USDA Forest Service and USDI BLM
Partnership for the Umpqua Rivers

Table of Contents

WATER QUALITY MANAGEMENT PLAN- ATTACHMENTS:

PART I. INTRODUCTION

This document describes strategies for implementing and achieving the Umpqua Basin Total Maximum Daily Loads (TMDLs). The main body of this text has been compiled by the Oregon Department of Environmental Quality (DEQ) with assistance from the Designated Management Agencies (DMAs) in the Umpqua Basin and includes a description of activities, programs, legal authorities, and other measures for which DEQ and the other DMAs have regulatory authority. This Water Quality Management Plan (WQMP) provides the overall framework describing the management efforts which will be implemented to attain the Umpqua Basin TMDLs. Appended to this document are specific Implementation Plans which describe each management agency's existing or planned efforts to implement their portion of the TMDLs. This relationship is presented schematically in Figure 7.1, below.

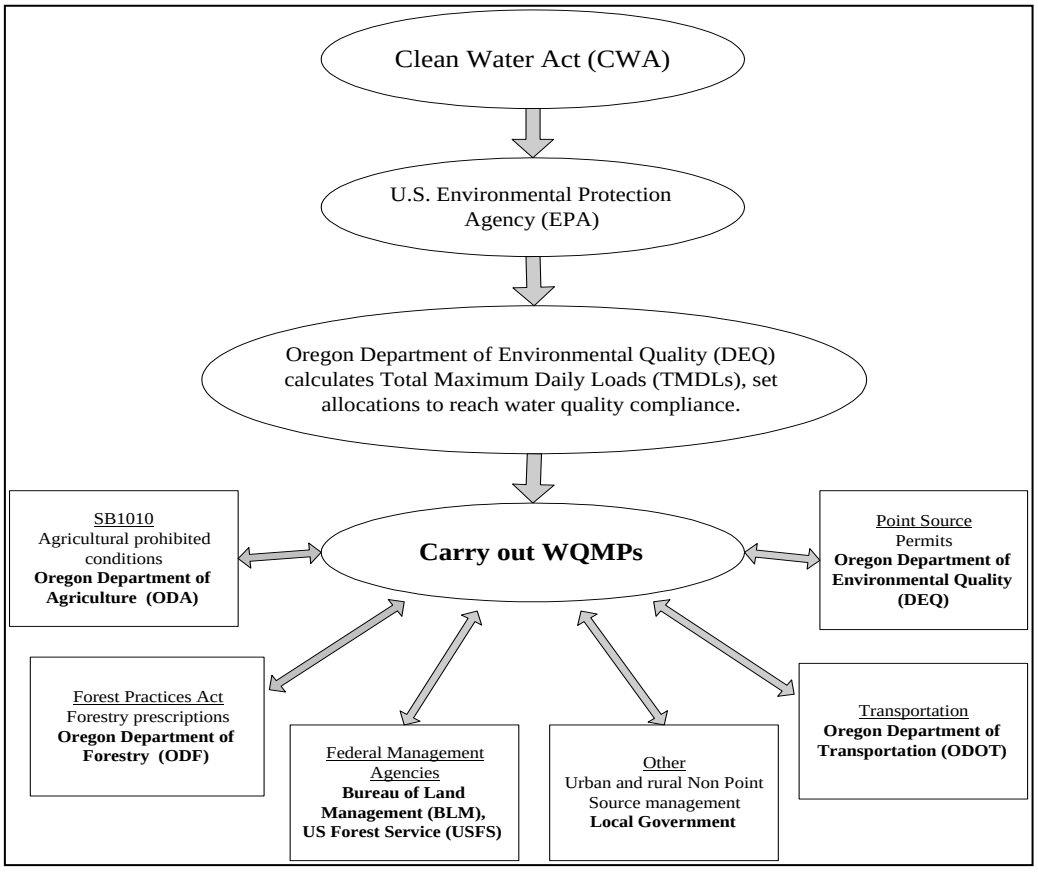
The focus of this WQMP is to demonstrate how TMDLs will be implemented in the Umpqua Basin. It builds upon existing point and nonpoint source Implementation Plans to outline a management approach for all land uses in the subbasin. Its organization incorporates the 15 plan elements required by OAR 340-042-0040(4)(l).

A. Umpqua Basin Designated Management Agencies

Designated Management Agencies (DMAs) are recognized by the State of Oregon as being those entities with the legal authority to ensure that the targets set forth in the TMDL are met (Oregon Administrative Rule OAR 340-042-0030 (2)). What follows is a listing of the DMAs in the Umpqua Basin by land use and their responsibilities under the TMDL. Also included are contacts for more information.

NOTE: *The term "zoning" may be used synonymously with "land use" in this document. However, in many cases it is the land use itself which determines which DMA has the authority and, therefore, which Implementation Plan is applicable.*

Figure 7.1 TMDL/WQMP/Implementation Plan Schematic



Douglas County
Land Use: Rural/Nonresource Lands in Douglas County

Urban/Nonresource land uses are under the authority of Douglas County. These land uses include:
All nonagricultural, nonforestry-related land uses including transportation uses (road, bridge, and ditch maintenance and construction practices)
Designing and siting of housing/home, commercial, and industrial sites in urban and rural areas
Golf courses and parks
Operation of Galesville Dam/Reservoir and Ben Irving Dam/Reservoir
Riparian Protection
Other land uses as applicable to the TMDL

Oregon Department of Agriculture
Land Use: Agriculture

Agricultural land uses are addressed in the *Umpqua Basin Agricultural Water Quality Management Area Plan* as required by Senate Bill 1010. A copy is attached as Exhibit A. Contact Eric Nusbaum, Oregon Department of Agriculture, at 541-302-3043, for more information. The land uses falling under this category include:
Agricultural or farm-related activities, both commercial and noncommercial including livestock stable and pastures, both inside and outside of municipal boundaries
Confined animal feeding operations (CAFO) and container nursery operations

Oregon Department of Forestry
Land Use: Forestry on Private Lands

Private lands' forestry uses are addressed in the Forest Practices Act. Contact Dave Lorenz, Oregon Department of Forestry in Roseburg, at 541-440-3412, for more information. The forest management activities covered under the Forest Practices Act are included in the following general categories:
Harvesting or Salvaging Trees
Site Preparation and Reforestation
Chemical Application
Clearing Forest Land for Nonforest Uses
Road Construction and Improvements
Precommercial Thinning Slash Disposal

USDI-Bureau of Land Management, USDA-Forest Service
Land Use: Federal Lands – USFS and BLM

Land uses on federal lands are addressed in the Northwest Forest Plan, associated Aquatic Conservation Strategy, and various Water Quality Restoration Plans developed by the Umpqua and Siuslaw National Forests and the Roseburg, Medford, and Coos Bay offices of the Bureau of Land Management. Contact Mikeal Jones, USFS, 541- 957-3356, or Lowell Duell, BLM, 541-464-3329, for more information.

Oregon Department of Transportation
Land Use: Roads, Highways and Bridges

State road issues are addressed in "Routine Road Maintenance, Water Quality and Habitat Guide Best Management Practices, July 2004." Contact ODOT Regional Environmental Coordinator, Sam Dunnavant, 541-957-3519 for more information.

DEQ - NPDES Permitted Operations

Land Use: Various Permitted Sources

Point sources are addressed through the National Pollutant Discharge Elimination System (NDPES). Permits are issued by Department of Environmental Quality (DEQ). Contact Paul Kennedy at DEQ's Roseburg office, 541-440-3338, x 228 for more information.

The incorporated cities in Douglas County

(Canyonville, Drain, Elkton, Myrtle Creek, Oakland, Reedsport, Riddle, Roseburg, Sutherlin, Winston, Yoncalla)

Land Use: Urban Land Uses within City Limits.

Generally, the cities are responsible for their governmental operations as well as zoning and permitting, urban runoff and drainage systems, streets and roads, and riparian protection.

Some of the cities are also DMAs by virtue of holding NPDES permits for their wastewater treatment plants.

Table 7.1 below identifies the 303(d) listed streams that are within the city limits of many of the cities in the basin.

Table 7.1 Umpqua Basin 303(d) Listed Streams Within City Limits

City	303(d) Streams Within City Limits	Other Streams Within City Limits, Including Tributaries of 303(d) Streams
Canyonville	Canyon Creek	Comer Branch
Drain	Elk Creek	Pass Creek (Elk Creek tributary)
Elkton	Elk Creek	
Myrtle Creek	North Myrtle Creek South Myrtle Creek	Tributary of South Umpqua River
Oakland	Calapooya Creek	
Reedsport	Umpqua River Scholfield Creek (Slough)	Providence Creek (Umpqua River tributary)
Riddle	Cow Creek	
Roseburg	South Umpqua River Deer Creek	Newton Creek and unnamed tributary Parrot Creek Sweetbriar Creek 2 unnamed tributaries to South Umpqua River
Sutherlin*	None, only tributaries of 303(d) listed	Sutherlin Creek (North Umpqua tributary) Cooper Creek
Winston	South Umpqua River	Lookingglass Creek (South Umpqua tributary)
Yoncalla	None	Yoncalla Creek (Elk Creek tributary)

* Sutherlin Creek and Cooper Creek are listed for toxic compounds which are not being addressed in this TMDL.

B. Adaptive Management

The goal of the Clean Water Act and associated Oregon Administrative Rules (OARs) is that water quality standards be met or that all feasible steps will be taken toward achieving the highest quality water attainable. This is a long-term goal in many watersheds, particularly where nonpoint sources are the main concern. To achieve this goal, implementation must begin as soon as possible.

TMDLs are numerical loadings that are set to limit pollutant levels such that in-stream water quality standards are met. DEQ recognizes that TMDLs are values calculated from mathematical models and other analytical techniques designed to simulate and/or predict very complex physical, chemical and biological processes. Models and techniques are simplifications of these complex processes and, as such, are unlikely to produce an exact prediction of how streams and other waterbodies will respond to the application of various management measures. It is for this reason that these TMDLs have been established with a margin of safety.

WQMPs are plans designed to reduce pollutant loads to meet TMDLs. DEQ recognizes that it may take some period of time - from several years to several decades - after full implementation before management practices identified in a WQMP (e.g., riparian restoration) become fully effective in reducing and controlling pollution. In addition, DEQ recognizes that technology for controlling nonpoint source pollution is, in many cases, in the development stages and will likely take one or more revisions to develop effective techniques. It is possible that after application of all reasonable best management practices, some TMDLs or their associated surrogates cannot be achieved as originally established. Figure 7.2 is a graphical representation of this adaptive management concept.

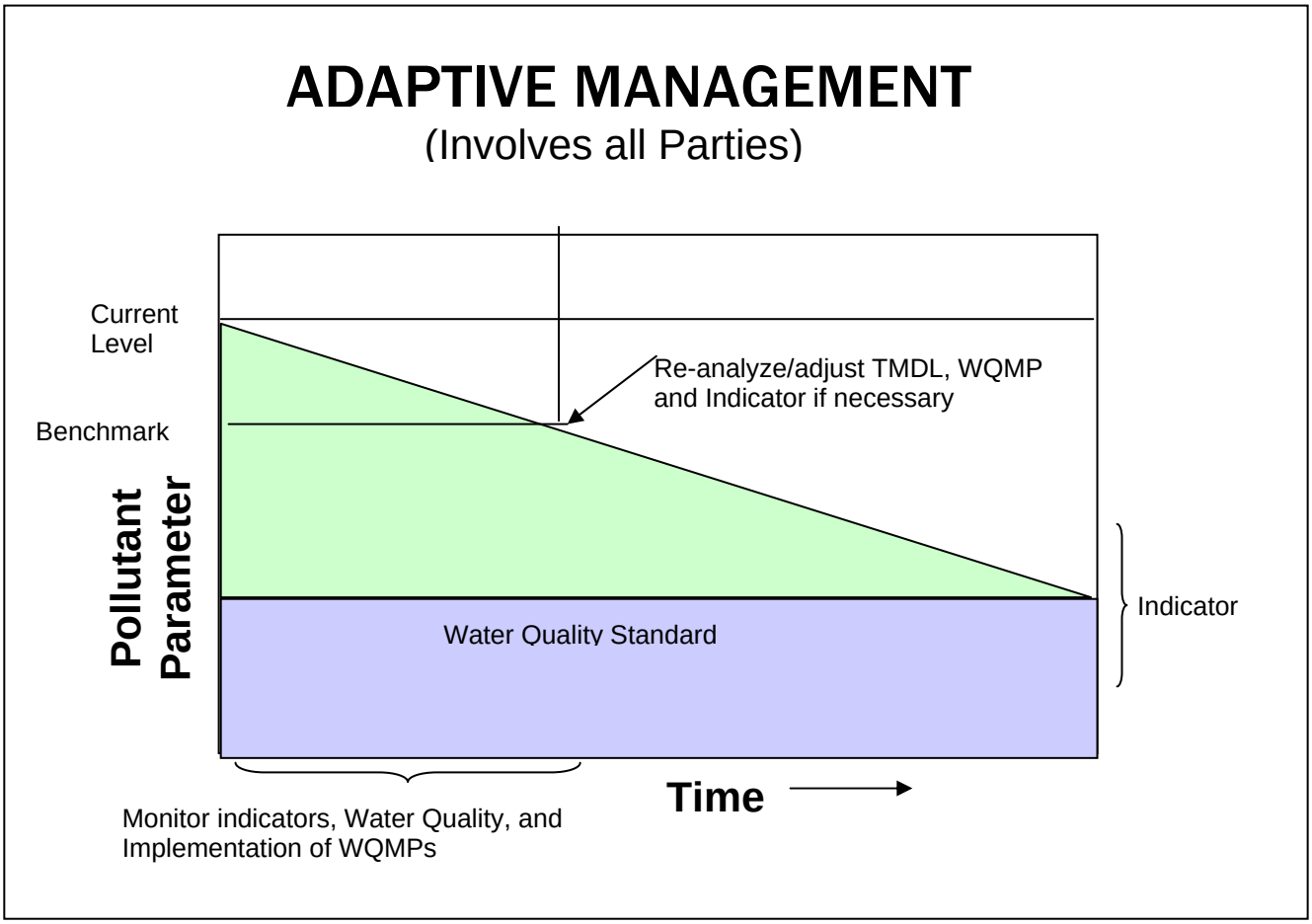


Figure 7.2 Adaptive Management Diagram

DEQ also recognizes that, despite the best and most sincere efforts, natural events beyond the control of humans may interfere with or delay attainment of the TMDLs and/or their associated surrogates. Such events could be, but are not limited to, floods, fire, insect infestations, and drought.

In the Umpqua Basin TMDLs, pollutant surrogates have been defined as alternative targets for meeting the TMDLs. The purpose of the surrogates is not to bar or eliminate human access or activity in the basin or its riparian areas. It is the expectation, however, that this WQMP and the associated DMA-specific Implementation Plans will address how human activities will be managed to achieve the surrogates. It is also recognized that full attainment of pollutant surrogates (system potential vegetation, for example) at all locations may not be feasible due to physical, legal or other regulatory constraints. To the extent possible, the Implementation Plans should identify potential constraints, but should also provide the ability to mitigate those constraints should the opportunity arise. For instance, at this time, the existing location of a road or highway may preclude attainment of system potential vegetation due to safety considerations. In the future, however, should the road be expanded or upgraded, consideration should be given to designs that support TMDL load allocations and pollutant surrogates such as system potential vegetation.

If a source is not given a load allocation, it does not necessarily mean that the source is prohibited from discharging any wastes. A source may be permitted to discharge by DEQ if the holder can adequately demonstrate that the discharge will not have a significant impact on water quality over that achieved by a zero allocation. For instance, a permit applicant may be able to demonstrate that a proposed thermal discharge would not have a measurable detrimental impact on projected stream temperatures when site temperature is achieved. Alternatively, in the case where a TMDL is set based upon attainment of a specific pollutant concentration, a source may be permitted to discharge at that concentration and still be considered as meeting a zero allocation.

If a nonpoint source that is covered by the TMDLs complies with its finalized Implementation Plan, it will be considered in compliance with the TMDL. In employing an adaptive management approach to the TMDLs and the WQMP, DEQ has the following expectations and intentions:

Monitoring and Review

Subject to available resources, on a five-year basis, DEQ intends to review the progress of the TMDLs and the WQMP.

In conducting this review, DEQ will evaluate the progress towards achieving the TMDLs (and water quality standards) and the success of implementing the WQMP.

DEQ expects that each DMA will also monitor and document its progress in implementing the provisions of its Implementation Plan. This information will be provided to DEQ for its use in reviewing the TMDLs.

As implementation of the WQMP and the associated Implementation Plans proceeds, DEQ expects that DMAs will develop benchmarks for attainment of TMDL surrogates, which can then be used to measure progress.

Where implementation of the Implementation Plans or effectiveness of management techniques is found to be inadequate, DEQ expects management agencies to revise the components of their Implementation Plan to address these deficiencies.

If DEQ determines that all appropriate measures are being taken by the DMAs, and water quality criteria will still not be met, DEQ may reopen the TMDL and revise as needed. DEQ would also consider reopening the TMDL, subject to available resources, should new information become available indicating that the TMDL or its associated surrogates should be modified.

The implementation of TMDLs and the associated plans is generally enforceable by DEQ, other state agencies and local government. However, it is envisioned that sufficient initiative exists to achieve water

quality goals with minimal enforcement. Should the need for additional effort emerge, it is expected that the responsible agency will work with land managers to overcome impediments to progress through education, technical support or enforcement. Enforcement may be necessary in instances of insufficient action towards progress. This could occur first through direct intervention from land management agencies (e.g., ODF, ODA, counties and cities), and secondarily through DEQ. The latter may be based on departmental orders to implement management goals leading to water quality standards.

C. Water Quality Management Plan Guidance and Rules

In February 2000, DEQ entered into a Memorandum of Agreement (MOA) with the U.S. Environmental Protection Agency (EPA) that described the basic elements needed in a WQMP. That MOA was endorsed by the Courts in a Consent Order signed by United States District Judge Michael R. Hogan in July 2000.

On December 2, 2002, DEQ adopted OAR 340-042-0025 – 0080 regarding TMDLs and WQMPs. OAR 340-042-0030(17) defines a Water Quality Management Plan as "the element of a TMDL describing strategies to achieve allocations identified in the TMDL to attain water quality standards." In addition, OAR 340-042-0040(4)(l) identifies the elements required in the WQMP which must accompany the TMDL, which includes those elements required by the MOA with EPA and the Court Order, as well as additional elements. These elements, as outlined below, will serve as the framework for this WQMP.

- Condition assessment and problem description.
- Goals and objectives.
- Proposed management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category.
- Timeline for implementing management strategies including:
    - Schedule for revising permits,
    - Schedule for achieving appropriate incremental and measurable water quality targets,
    - Schedule for implementing control actions, and
    - Schedule for completing other measurable milestones.
- Explanation of how implementing the management strategies will result in attainment of water quality standards.
- Timeline for attainment of water quality standards.
- Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans.
- Identification of sector-specific or source-specific implementation plans that are available at the time the TMDL is issued.
- Schedule for preparation and submission of sector-specific or source-specific implementation plans by responsible persons, including DMAs, and processes that trigger revisions to these implementation plans.
- Description of reasonable assurance that management strategies and sector-specific or source-specific implementation plans will be carried out through regulatory or voluntary actions.
- Plan to monitor and evaluate progress toward achieving TMDL allocations and water quality standards including:
    - Identification of persons responsible for monitoring, and
    - Plan and schedule for reviewing monitoring information and revising the TMDL.
- Plan for public involvement in implementing management strategies.
- Description of planned efforts to maintain management strategies over time.
- General discussion of costs and funding for implementing management strategies. Sector-specific or source-specific implementation plans may provide more detailed analyses of costs and funding for specific management strategies.
- Citation of legal authorities relating to implementation of management strategies.

Some of the DMAs named in the Umpqua Basin TMDLs have submitted preliminary Implementation Plans that are appended to this document. These Implementation Plans, when complete, are expected to fully describe DMA efforts to achieve their appropriate allocations, and ultimately, water quality standards. Since the DMAs will require some time to fully develop these Implementation Plans once the TMDLs are finalized, the first versions of the Implementation Plans are not expected to completely describe management efforts. In the case of the Departments of Agriculture and Forestry, a description of the current regulatory program, which serves as an Implementation Plan, is appended.

DEQ recognizes that TMDL implementation is critical to the attainment of water quality standards. Additionally, the support of DMAs in TMDL implementation is essential. In instances where DEQ has no direct authority for implementation, it will work with DMAs on implementation to ensure attainment of the TMDL allocations and, ultimately, water quality standards. Where DEQ has direct authority, it will use that authority to ensure attainment of the TMDL allocations and water quality standards.

PART II – WATER QUALITY MANAGEMENT PLAN COMPONENTS

Component 1. Condition Assessment and Problem Description

A. Beneficial Uses

Oregon Administrative Rules (OAR Chapter 340, Division 41, Table 320A) list the "Beneficial Uses" occurring within the Umpqua Basin and are set forth in Table 7.2 below. Numeric and narrative water quality standards are designed to protect the most sensitive beneficial uses.

Table 7.2 Beneficial Uses Occurring in the Umpqua Basin (OAR 340 – 041 – 0320)

Beneficial Use	Occurring	Beneficial Use	Occurring
Public Domestic Water Supply	✓	Salmonid Fish Spawning (Trout)	✓
Private Domestic Water Supply	✓	Salmonid Fish Rearing (Trout)	✓
Industrial Water Supply	✓	Resident Fish and Aquatic Life	✓
Irrigation	✓	Anadromous Fish Passage	✓
Livestock Watering	✓	Wildlife and Hunting	✓
Boating	✓	Fishing	✓
Hydro Power	✓	Water Contact Recreation	✓
Aesthetic Quality	✓	Commercial Navigation and Transportation	✓

B. Umpqua Basin Streams on 303(d) List Addressed by 2006 TMDLs

Please see Appendix D for a complete list of Umpqua Basin streams on the 303(d) list. Table 7.3 below summarizes the status of listings in the three subbasins covered by the 2006 TMDLs.

Table 7.3 Number of 303(d) Listed Stream Miles in the Umpqua Basin and (Number of listed segments)

Parameter	South Umpqua Subbasin	North Umpqua Subbasin	Mainstem Umpqua Subbasin	Total
Temperature – Rearing	603.4 (68)	247.3 (27)	514.5 (39)	1,365.2 (134)
Temperature – Spawning	65.3 (12)	70.6 (11)	4.2 (2)	140.1 (25)
pH	163.7 (7)	38.6 (7)	25.3 (3)	227.6 (17)
Dissolved Oxygen	78.4 (2)	16.7 (3)	81.7 (2)	176.8 (7)
Bacteria – Summer	76.4 (5)	0	0	76.4 (5)
Bacteria – Fall, Winter, Spring	16.3 (3)	0	162.6 (9)	178.9 (12)
Bacteria – All Year - Shellfish	0	0	123.1 (8)	123.1 (8)
Biological Criteria	101.2 (5)	0	12.7 (1)	113.9 (6)
Aquatic Weeds/Algae	57.7 (2)	3.7 (1)	0	61.4 (3)
Chlorophyll a	41.8 (1)	0	0	41.8 (1)
Phosphorus	15.9 (1)	0	0	15.9 (1)
Total Stream Miles with One or More Listings*	728.0 (106)	291.6 (49)	649.5 (64)	1,669.1 (219)

*Streams with more than one listing were counted only once in the total stream miles.

C. Existing Sources of Water Pollution

Temperature

Surface water temperatures in the Umpqua Basin are heavily influenced by human activities. These activities are diverse and may have either a detrimental or a beneficial impact on river temperature. Some of these activities have a readily observable and direct impact on water temperature, such as cool water releases from reservoirs, while other activities may have a less observable impact, such as the loss of riparian vegetation (shading), water withdrawal and the disconnection of floodplains to rivers.

Riparian vegetation, stream morphology, hydrology, climate, and geographic location influence stream temperature. While climate and geographic location are outside of human control, the condition of the riparian area, channel morphology and hydrology can be affected by land use activities. Specifically, elevated summertime stream temperatures attributed to human activities may result from the following conditions within the Umpqua Basin:

1. Riparian vegetation disturbance that reduces stream surface shading, riparian vegetation height, and riparian vegetation density (shade is commonly measured as percent effective shade);

2. Channel widening (increased width to depth ratios) due to factors such as loss of riparian vegetation that increases the stream surface area exposed to energy processes, namely solar radiation;

3. Reduced flow volumes (from irrigation, industrial, and municipal withdrawals) or increased high temperature discharges; and

4. Disconnected floodplains which prevent/reduce groundwater discharge into the river.

Dissolved Oxygen Depletion and Nutrients (Nitrogen and Phosphorus)

The primary human-caused sources of total nitrogen and phosphorus in the Umpqua Basin are the following (this listing is not meant to be comprehensive, but it does contain the most probable sources in the subbasin):

1. Wastewater Treatment Plants and Sanitary Sewer Systems
Currently most of the wastewater treatment plants in the Umpqua Basin discharge during the nutrient TMDL period. Wasteload allocations have been assigned to these plants, which are expected to reduce nutrients sufficiently to meet Dissolved Oxygen and pH standards. Sanitary sewer system overflows are typically minimal during the TMDL period.

2. Permitted Sites other than POTWs
Discharges from other permitted sites (industrial, etc.) may contain nitrogen or phosphorus either in storm water runoff or in direct discharges.

3. Urban Runoff
Urban runoff can be quite high in total nutrient concentrations. The ultimate sources could include fertilizers, erosion, pet waste, cross-connections, etc.

4. Rural Runoff
Rural runoff may contain phosphorus and nitrogen from the same sources as urban runoff, with the exception of sanitary sewers. Additional potential sources are “hobby” farms, horse pastures, and ranchettes. These sites are often stocked very densely and may have poor management. The density of septic systems is usually relatively high in rural areas and therefore the possibility of failing systems is also quite high. Wildlife fecal contamination can also add to the nutrient load.

5. Agricultural Runoff

Some of the potential sources of nutrients in agricultural runoff are fertilizers, animal waste, and erosion, especially when improper application or inadequate management occurs.

6. Forestry Runoff
Since surface runoff in forested areas during the TMDL season is expected to be minimal, nutrient loads from forestry operations are most likely predominately associated with roads and culverts.

7. Failing Septic Systems
Effluent from failing septic systems will contain nitrogen and phosphorus, along with bacteria, BOD and other pollutants.

8. Instream and Near-stream Erosion
Phosphorus contained in soils may be transported to the critical segments of the South Umpqua River through instream and near-stream erosion. While a certain amount of this erosion is natural, some erosion (especially during the summer), results from human activity.

Bacteria

The following is a listing of *possible* bacteria sources in the basin. This listing is not meant to be comprehensive, but it does contain the most probable sources of bacteria in the basin.

1. Wastewater Treatment Plants and Sanitary Sewer Systems
There are numerous wastewater treatment plants in the basin. The bacteria discharge limits on each of the plants is well below the criteria and therefore they generally have a diluting effect on bacteria concentrations. A possible exception to this is during overflow or bypass situations. A bypass would result in higher bacteria concentrations at the plant's normal outfall, whereas overflows (upsets) could occur at almost any place within the sewerage system. System operators are required to report bypasses and sewer system upsets.

2. Cross Connections
Cross connections between sanitary and storm sewer systems occur and can be a significant source of bacteria loading during both wet and dry weather.

3. Permitted Sites other than Wastewater Treatment Plants
Discharges from other permitted sites (industrial, etc.) may contain bacteria in either storm water or direct discharges. These permits will be reviewed to determine this potential.

4. Direct Deposition
Bacteria may be directly deposited into surface waters by domestic animals and pets, livestock, birds and other animals.

5. Illegal Dumping
The illegal dumping of wastes either to storm sewer systems or directly to surface waters is a potential bacteria source. This dumping may be of portable toilet wastes, recreational vehicle wastes, etc.

6. Urban Runoff
Instream bacteria values in urban watersheds can be very high during runoff events. Data from storm water sampling points to urban runoff as a significant source of bacteria in surface waters. The ultimate sources of these bacteria are most likely multiple and may include:
Pet and other animal waste
Illegal dumping
Failing septic systems
Sanitary sewer cross-connections and overflows

7. Rural Runoff
Rural runoff may contain bacteria from the same sources as urban runoff, with the exception of sanitary sewers. Additional potential sources are "hobby" farms, horse pastures and ranchettes. These sites are

often stocked very densely and may have poor management practices. The density of septic systems is usually relatively high in rural areas and therefore the possibility of failing systems contributing to bacteria problems is also quite high.

8. Agricultural Runoff
The primary source of bacteria in agricultural runoff is most likely animal waste. This animal waste may be from livestock grazing in pasture, inappropriate waste management practices, faulty waste systems, etc. (Direct discharges from confined animal feeding operations (CAFOs) are prohibited in Oregon).

9. Wildlife
There are likely contributions of bacteria from the various forms of wildlife in the basin: bear, deer, elk, beavers, geese, ducks, cormorants, seals and sea lions, and many smaller species. The extent of the wildlife contribution is not known at all flows, but the Smith River Bacteria Source Tracking Study found that at lower flows, wildlife contributions, particularly from avian species, can be significant.

Component 2: Goals and Objectives

The overall goal of the TMDL Water Quality Management Plan (WQMP) is to achieve compliance with water quality standards for each of the 303(d) listed parameters and streams in the Umpqua Basin. Specifically the WQMP combines a description of all Designated Management Agencies' (DMA) plans that are or will be in place to address the load and wasteload allocations in the TMDL. The specific goal of this WQMP is to describe a strategy for reducing discharges from nonpoint sources to the level of the load allocations and for reducing discharges from point sources to the level of the waste load allocations described in the TMDL. As discussed above, this plan is preliminary in nature and is designed to be adaptive as more information and knowledge are gained regarding the pollutants, allocations, management measures, and other related areas.

The expectations of all DMAs are to:

- Develop Best Management Practices (BMPs) to achieve Load Allocations and Waste Load Allocations
- Give reasonable assurance that management measures will meet load allocations; through both quantitative and qualitative analysis of management measures
- Adhere to measurable milestones for progress
- Develop a timeline for implementation, with reference to costs and funding
- Develop a monitoring plan to determine if:
    - BMPs are being implemented
    - Individual BMPs are effective
    - Load and wasteload allocations are being met
    - Water quality standards are being met

Component 3: Proposed Management Strategies

This section of the plan outlines the proposed management measures that are designed to meet the wasteload allocations and load allocations of each TMDL. The timelines for addressing these measures are given in the following section.

The management measures to meet the load and wasteload allocations may differ depending on the source of the pollutant. Given below is a categorization of the sources and a description of the management measures being proposed for each source category.

A. Wastewater Treatment Plants

The following wastewater treatment plants require and currently hold NPDES permits in the Umpqua Basin:

Umpqua Subbasin:
Brandy Bar Landing, Inc.
City of Drain
City of Oakland
City of Reedsport
Rice Hill Owners Association (Rice Hill West Lagoon)
City of Sutherlin
Douglas County Public Works (Reedsport Landfill)
Patel, Maganbhai (Rice Hill East Lagoon)
Winchester Bay Sanitary District
City of Yoncalla

South Umpqua Subbasin:
Arden Development (Green Diamond Sand Products)
City of Canyonville
Douglas County Public Works (Roseburg Landfill)
City of Glendale
City of Myrtle Creek
City of Riddle
Roseburg Urban Sanitary Authority
USDA – Forest Service (Tiller Ranger Station)
City of Winston

North Umpqua Subbasin:
Douglas County Public Works (Glide/Idleyld Collector System)
USDA – Forest Service (Wolf Creek)

The Department's Watershed Based Permit Plan targets 2010 for NPDES permit renewal in the North and South Umpqua subbasins and 2007 for NPDES permit renewal in the Mainstem Umpqua subbasin. The TMDL Waste Load Allocations will be incorporated into the permits at that time. The Department may allow for compliance schedules in the permits on a case-by-case basis. Prior to renewing these permits, the Department will work with communities to develop site specific implementation plans. Several permitted facilities are under Department order to begin planning for treatment plant upgrades upon EPA approval of the TMDL

Most of these permits have recently been, or will be, renewed before the TMDLs are finalized. Some of the permits contain requirements to implement TMDLs according to a schedule triggered by the adoption of the TMDLs. The current schedule for issuing the new permits is shown in Table 7.4.

Table 7.4 Schedule for Incorporation of Wasteload Allocations into NPDES Permits

Permittee Name	Expiration	USGS Subbasin	Target Year
Glide-Idleyld Park	May-10	North Umpqua	N.A. - No impact
USFS - Wolf Creek CCC	Mar-09	North Umpqua	N.A. - No impact
Canyonville WWTP	May-09	South Umpqua	Facilities plan due 1 year from TMDL
Winston-Green WWTP	Jun-07	South Umpqua	2010
Glendale WWTP	May-10	South Umpqua	Facilities plan due 9 months from TMDL
Green Diamond Products	Mar-96	South Umpqua	N.A. – No impact
RUSA Roseburg WWTP	Sep-97	South Umpqua	Facilities plan due 9 months from TMDL
Roseburg Landfill Leachate	Mar-98	South Umpqua	2010
Riddle WWTP	Mar-10	South Umpqua	2010
Green Diamond Sand Products	Dec-04	South Umpqua	N.A. – No impact
Myrtle Creek WWTP	Sep-08	South Umpqua	N.A. – No impact
USFS Tiller Ranger Station WWTP	Apr-09	South Umpqua	N.A. – No impact
Hoover Treated Wood Products	May-10	South Umpqua	N.A. – No impact
Reedsport WWTP	Oct-09	Umpqua	MAO
Rice Hill East Lagoon	Nov-09	Umpqua	2007
Drain WWTP	Nov-09	Umpqua	Facilities plan due 1 year from TMDL
Winchester Bay WWTP	Nov-09	Umpqua	MAO
Reedsport Landfill	Aug-01	Umpqua	MAO
Rice Hill West Lagoon	May-04	Umpqua	2007
Yoncalla WWTP	Jun-04	Umpqua	2007
Oakland WWTP	Aug-05	Umpqua	2007
Sutherlin WWTP	Dec-05	Umpqua	2007
Brandy Bar Landing, Inc.	Mar-09	Umpqua	N.A. – No impact
IP Gardiner Paper	Apr-09	Umpqua	Business is closed

B. General and Minor Individual NPDES Permitted Sources

There are many general and minor individual NPDES permits in the Umpqua Basin. These permits will be reviewed and, if necessary, modified to ensure compliance with allocations. Either numeric effluent limits will be incorporated into the permits or specific management measures and plans will be developed.

C. Other Sources

For discharges from sources other than the WWTPs and those permitted under general or minor NPDES permits, DEQ has assembled an initial listing of management categories. This listing, given in Table 7.5 below, is designed to be used by the designated management agencies (DMAs) as guidance for selecting management measures to be included in their Implementation Plans. Each DMA will be responsible for examining the categories in Table 7.4 to determine if the source and/or management measure is applicable within their jurisdiction. This listing is not comprehensive and other sources and management measures will most likely be added by the DMAs where appropriate. For each source or measure deemed applicable, a listing of the frequency and extent of application should also be provided. In addition, each of the DMAs is responsible for source assessment and identification, which may result in additional categories. It is crucial that management measures be directly linked with their effectiveness at reducing pollutant loading contribution.

Table 7.5 Management Measures

Management Measure/ Source Category	Parameter					
	Temperature	Biocriteria	Dissolved Oxygen	Nutrients and pH	Sediment	Bacteria
Public Awareness and Education						
General Outreach	X	X	X	X	X	X
Targeted Outreach	X	X	X	X	X	X
New Development and Construction						
Planning Procedures	X	X	X	X	X	
Permitting/Design	X	X	X	X	X	
Education and Outreach	X	X	X	X	X	
Construction Erosion Control	X	X	X	X	X	
Post-Construction Erosion Control	X	X	X	X	X	
Inspection/Enforcement	X	X	X	X	X	
Storm Drain System Construction	X	X	X	X	X	
Existing Development						
Storm Drain System Operation and Maintenance		X	X	X	X	X
Commercial and Industrial Facilities						
Parking Lot Runoff		X	X	X	X	X
Source Control		X	X	X	X	
Pet Waste and Fertilizers		X	X	X	X	X
Illegal Dumping		X	X	X	X	X

Residential						
Illegal Dumping		X	X	X	X	X
Illicit Discharges and Cross Connections		X	X	X	X	X
Riparian Area Management						
Rural/Urban Residential Riparian Protection/ Enhancement	X	X	X	X	X	X
Streambank Stabilization	X	X	X	X	X	
Public/Governmental Facilities Including Parks						
Public Waterbody Protection		X	X	X	X	X
Operation and Maintenance		X	X	X	X	X
Public Buildings and Facilities		X	X	X		X
Pet Wastes and Fertilizers		X	X	X		X
Forest Practices						
Implement Forest Practices Act (State and Private Lands)	X	X	X	X	X	
Implement Resource Management Plans (Federal)	X	X	X	X	X	
Riparian Protection/ Enhancement	X	X	X	X	X	X
Replace/Restore Roads/Culverts	X	X	X	X	X	
Agricultural Practices						
Implement SB 1010 AgWQMAP	X	X	X	X	X	X
Livestock Management Training	X	X	X	X	X	X
Nutrient Management Plans		X	X	X	X	X
Riparian Protection/ Enhancement	X	X	X	X	X	X
Wetland Protection/ Enhancement	X	X	X	X	X	X
Reconnect Sloughs and Rivers	X	X	X	X		

Replace Defective Tidegates/ Culverts		X		X		
Set Back Levies and Dikes		X		X	X	
CAFO Implementation	X	X	X	X	X	X
Planning and Assessment						
Source Assessment/ Identification	X	X	X	X	X	X
Source Control Planning	X	X	X	X	X	X
Monitoring and Evaluation						
BMP Implementation Monitoring	X	X	X	X	X	X
BMP Evaluation	X	X	X	X	X	X
Instream Monitoring	X	X	X	X	X	X

Specific Pollutant Strategies

In addition to the strategies identified earlier in this WQMP, more specific strategies have been identified for the Umpqua Basin's two most widespread impairments on the 303(d) list, stream temperature and bacteria.

Stream Temperature

I. Control Strategies:

A. Increase Stream Shade

The primary strategy for achieving the temperature standard is to increase stream shade through riparian establishment and enhancement throughout temperature-impacted watersheds.

This strategy relies heavily on efforts such as those of Watershed Councils, Soil and Water Conservation Districts, and the U.S. Department of Agriculture to assist private landowners who want to restore and enhance their riparian areas. The Partnership for the Umpqua Rivers (PUR) has already helped many landowners by securing grant funds and implementing riparian fencing and planting projects throughout the basin, and the Douglas and Umpqua Soil and Water Conservation Districts have likewise helped landowners improve riparian areas and restore streambanks. State and federal agencies, including DEQ, have assisted these efforts through grants and technical assistance. In addition, both the Umpqua National Forest and the Bureau of Land Management are undertaking riparian restoration on their lands.

The PUR, together with Kent Smith of Insight Consultants, has developed a CD with extensive data and information regarding stream temperature in the Umpqua Basin. The CD includes a GIS-based system to incorporate stream habitat survey data from the Oregon Department of Fish and Wildlife and calculate the shade and heat energy received by each stream. The CD includes the report Stream Temperature in the Umpqua Basin: Characteristics and Management Implications, Kent Smith, 2003, as well as other technical papers regarding stream temperature.

In addition to the information on the CD, the PUR uses two tools to focus its riparian enhancement efforts. First, the Council uses a matrix to prioritize applications for financial assistance for fencing and planting projects. Second, the Council has conducted extensive assessments of private land in the basin and has identified areas where riparian areas are in need of restoration and enhancement, as well as other activities which can lead to improved water quality.

Specific recommendations for each watershed relating to temperature are at the end of this Temperature Section.

B. Identify and Protect Thermal Refugia

Thermal refugia are places with cooler water where cold water fish can escape some of the impacts of high stream temperatures.

In Stream Temperature in the Umpqua Basin: Characteristics and Management Implications, Kent Smith, 2003, the author noted that the mouths of small and medium streams in the Umpqua basin frequently have significant groundwater storage and can provide thermal refugia for fish during times of high stream temperature. The recommendations of the Partnership for the Umpqua Rivers at the end of this section reflect the concept of identifying and protecting these critical areas for cold water fish.

C. Increase Riparian Wetlands

Encouraging the voluntary creation or restoration of riparian wetlands will assist with moderating stream temperature and improving streamflows later in the summer.

D. Increase Hyporheic Flow

Hyporheic flow is water flowing through a stream's substrate, the material on the bottom and sides of a stream. ODFW stream surveys have identified areas with bedrock substrates that present a barrier to hyporheic flow. Instream habitat restoration projects which place large woody debris and boulders in streams provide cover for fish, collect gravel that fish need for spawning, and, many believe, increase hyporheic flow through the cool accumulated gravels, lowering stream temperature.

E. Increase Streamflow

Generally speaking, an increase in streamflow during the low flow summer period would be expected to assist with temperature control. However, Kent Smith's work showed that in extremely low flows, some streams become more dominated by inputs of groundwater, typically colder than summer surface flows.

Despite this effect, increasing streamflows throughout the summer period is expected to assist with overall stream temperature moderation. The Watershed Council's recommendations to increase streamflow are included below.

II. Partnership for the Umpqua Rivers Action Plan Recommendations:

Over the past several years, the Partnership for the Umpqua Rivers worked with local landowners and resource specialists to develop Watershed Assessment and Action Plans for many watersheds in the Umpqua Basin, focusing on those which have significant private ownership. These assessments included monthly meetings with landowners to review scientific information about a specific aspect of watershed health, including water quality, riparian areas, wetlands, and water quantity.

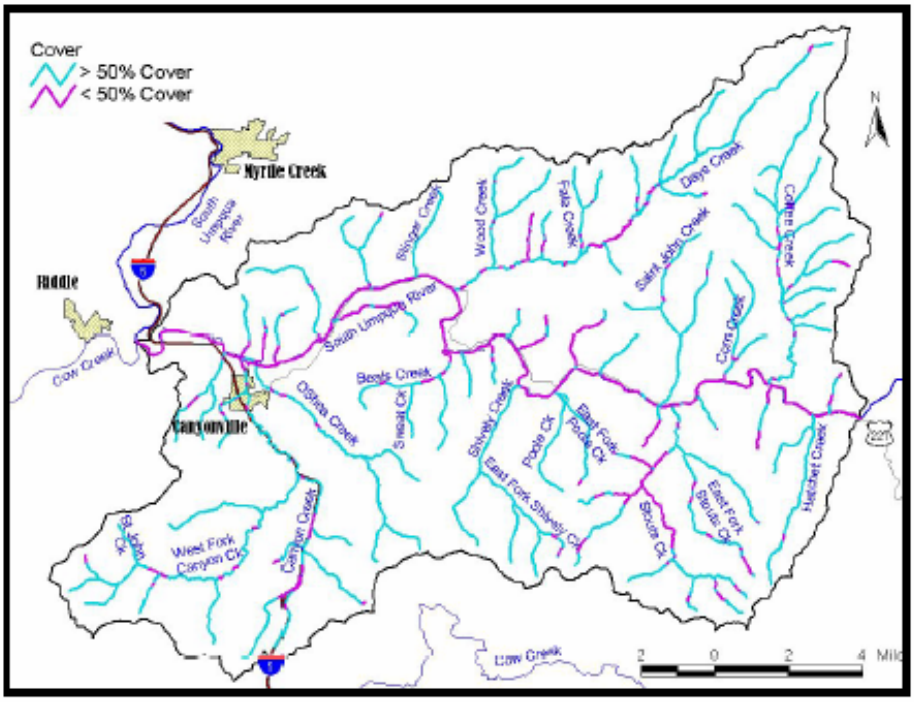
The assessments have been funded by grants from the Oregon Watershed Enhancement Board, the Clean Water Act 319 grant program administered by DEQ, and other sources. The assessments have followed protocols established in the Oregon Watershed Assessment Manual. The Watershed Assessment and Action Plan documents can be found on the Internet at http://www.ubwc.org/.

The assessments are used by the Council to identify priority areas for restoration. The Council assists willing landowners in priority areas to seek funds for restoration

The following recommendations are excerpted from the various Watershed Assessment and Action Plans, specifically recommendations on water quality, riparian areas, wetlands, and water quantity. The documents themselves contain many more recommendations relevant to watershed health, as well as an excellent compendium of known data and information about each watershed, its history, past conditions and landowner viewpoints.

These recommendations are offered as the most appropriate starting points and priority areas for implementation of the temperature load allocations.

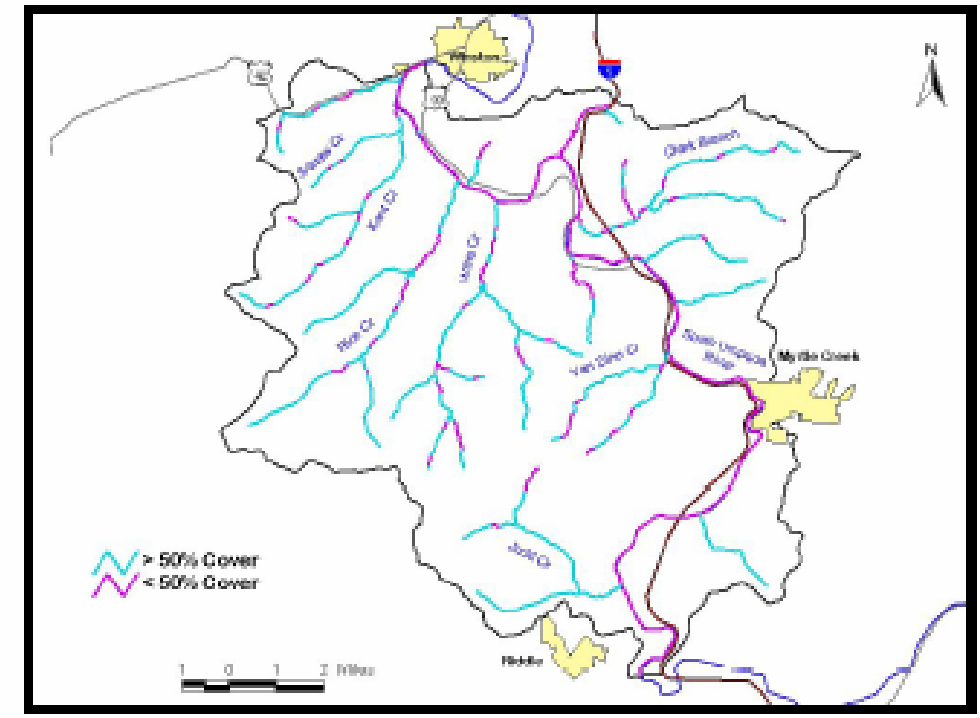
South Umpqua River Watershed



- Plant trees (especially conifers), remove blackberries, and fence riparian areas along Coffee Creek, Days Creek, Stinger Gulch, Wood Creek, and Beals Creek. Install upland stock water systems as appropriate.
- Work with landowners on a case-by-case basis to create or improve wetlands, especially along the South Umpqua River in the Morgan Creek area.
- Install efficient irrigation systems and encourage instream water leasing on streams with irrigation rights, such as the South Umpqua River.
- Identify stream reaches that may serve as “oases” for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams’ riparian buffers and, when appropriate, improve instream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams or where pH is a problem, shade by encouraging wide riparian buffers and managing for full canopies.
- Where canopy cover is less than 50%, establish wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by grass, brush, and blackberry and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Where riparian buffers are one tree wide or less, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Maintain riparian zones that are two or more trees wide and provide more than 50% cover.
- Encourage best management practices that limit wetland damage, such as off-channel watering, hardened crossings, livestock exclusion (part or all of the year), and providing stream shade.
- Develop opportunities to increase awareness of what defines a wetland, its functions and benefits. This is a fundamental step in creating landowner interest and developing landowner appreciation for wetland conservation.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders.
- Establish an approachable “one-stop shop” or clearinghouse to assist landowners in enrolling in programs that can benefit wetlands and meet landowner goals

- Reduce summer water consumption through instream water leasing and by improving irrigation efficiency.
- Educate landowners about proper irrigation methods and the benefits of improved irrigation efficiency.
- Continue monitoring peak flow trends in the watershed. Try to determine the role of vegetative cover, flooding, road density, and the TSZ on water volume.

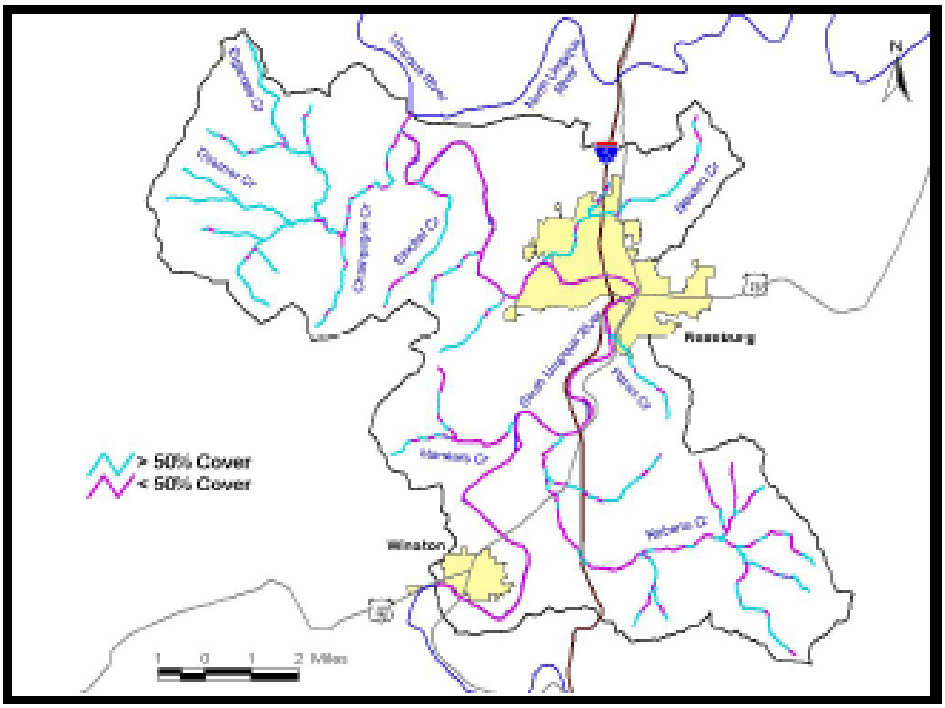
Middle South Umpqua Watershed



- Improve irrigation efficiency and instream water leasing (all streams with water rights)
- Riparian planting, blackberry conversion, fencing, and alternative livestock watering systems (especially the South Umpqua River from Rice Creek to Barrett Creek, Clarks Branch Creek, and Willis Creek).
- Where canopy cover is less than 50%, establish wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by blackberries and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Investigate methods of controlling blackberries.
- Where riparian buffers are one tree wide or less, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Maintain riparian zones that are two or more trees wide and, along tributaries, provide more than 50% cover.
- Expand forested riparian zones and riverine wetlands by planting hydrophytic tree species in locations having appropriate conditions at a density sufficient to improve functions over time.
- Provide information to landowners explaining the benefits of eliminating livestock access to streams, establishing effective buffer zones, the importance of wetland functions within watersheds, promoting the understanding of the interconnectedness of water resources, and the effects of impacts on downstream conditions.
- Educate policy makers, landowners, and community members on the importance of maintaining wetlands for healthy watersheds, and their educational, recreational, and aesthetic values for the local community.

- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve instream conditions by placing logs and boulders within the active stream channel to enhance large woody debris abundance and create pools.
- In very warm streams and where dissolved oxygen and pH are a problem, increase shade by encouraging wide riparian buffers and managing for native trees and full canopies.
- Reduce summer water consumption through instream water leasing and by improving irrigation efficiency.
- Continue monitoring peak flow trends in the watershed. Try to determine the role of vegetative cover, flooding, road density, and the TSZ on water volume.
- Educate landowners about proper irrigation methods and the benefits of improved irrigation efficiency.

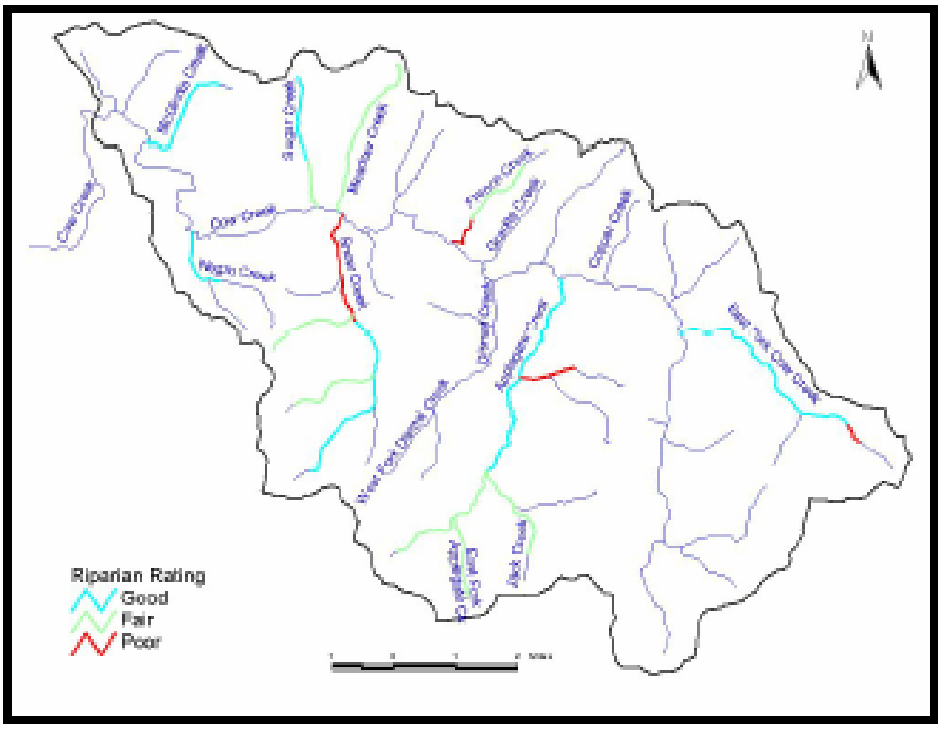
Lower South Umpqua Watershed



- Riparian planting, blackberry conversion, fencing, and alternative livestock watering systems, especially on the South Umpqua River, Champagne Creek, Roberts Creek, and Marsters Creek.
- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, if needed, improve instream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams, increase shade by encouraging wide riparian buffers and managing for full canopies.
- Where canopy cover is less than 50%, establish wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by blackberries and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Investigate methods of controlling blackberries.
- Where riparian buffers are one tree wide or less, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Maintain riparian zones that are two or more trees wide and, along tributaries, provide more than 50% cover.

- Enhance riverine and palustrine wetlands through high-density planting and seeding in locations with appropriate conditions.
- Educate policy makers, landowners, and community members on the importance of maintaining wetlands for healthy watersheds, and their educational, recreational, and aesthetic values for the local community.
- Opportunities for wetland restoration are limited in urban areas due to the higher cost of land. Wetlands established in urban areas provide several benefits, and should be protected for the long term to maximize their potential.
- Increase summer streamflow levels through instream water leasing and by improving irrigation efficiency.
- Continue monitoring peak flow trends in the watershed. Try to determine the role of vegetative cover, flooding, road density, and the transient snow zone on water volume.
- Educate landowners about proper irrigation methods and the benefits of improved irrigation efficiency.

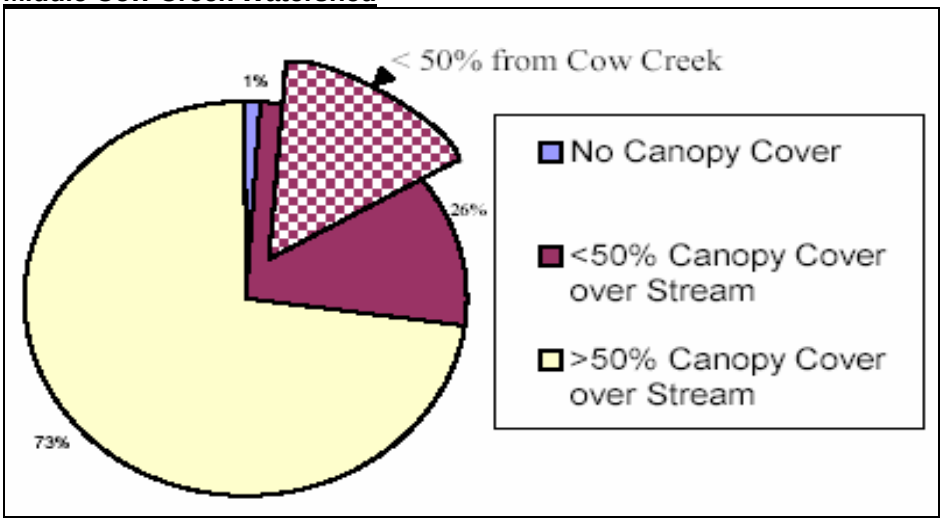
Upper Cow Creek Watershed



- Use ground surveys and, when available, digital aerial photographs to identify the following riparian conditions:
- Streams segments where canopy cover is less than 50%: In these areas, establish wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams which more than 50% canopy cover is possible.
- Riparian zones dominated by brush/blackberry: Convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Riparian buffers that are one tree wide or less: In these areas, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Encourage landowners to reduce damage to wetlands through activities such as off-channel watering, building hardened crossings, improving irrigation efficiency, livestock exclusion (part or all of the year), and providing upland shade.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders. A restoration demonstration project on public land might be well received by local residents because of the high percentage of public land in the region.

- Establish an approachable "one-stop shop" or clearinghouse to assist landowners in enrolling in programs that can benefit wetlands and meet landowner goals.
- Identify stream reaches along the mainstem of Cow Creek that may serve as "oases" for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve instream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- Reduce summer water consumption through instream water leasing and by improving irrigation efficiency.
- Educate landowners about proper irrigation methods and the benefits of improved irrigation efficiency.
- Continue monitoring peak flow trends in the watershed. Try to determine the role of vegetative cover, flooding, road density, and the TSZ on water volume.

Middle Cow Creek Watershed



Entire Middle Cow Creek Watershed

- Plant trees and shrubs in riparian areas. High priorities are those with less than 50% canopy cover and have a channel width for which 50% or greater cover is feasible (82 miles of riparian areas).
- Encourage other native understory and tree species in monoculture riparian areas, especially those dominated by alder.
- Conduct blackberry removal in a way that minimizes sedimentation and interplant with trees.
- Establish conifers and other native vegetation in areas now dominated by blackberries (low priority, 6 miles of riparian areas).
- Place large woody material in streams less than 30 feet wide on a site-by-site basis.
- Protect and enhance existing wetlands.

Cow Creek from Starvout Creek to Woodford Creek

- Develop stream restoration project with Azalea Landowner Group.

Woodford/ Fortune Branch Subwatershed

- Limit livestock access to riparian habitat and streams through riparian fencing (some areas are already fenced), cattle crossings, off-channel watering, off-channel provision of shade, and cross fencing. Continue to use designated stream crossings and minimize number of crossings.
- Modify placement of power lines along Fortune Branch. Current maintenance requires pruning streamside trees and limits riparian habitat development.

Windy Subwatershed

- Limit livestock access to riparian habitat and streams through riparian fencing, cattle crossings, off-channel watering, off-channel provision of shade, and cross fencing. Continue to use designated stream crossings and minimize number of crossings.

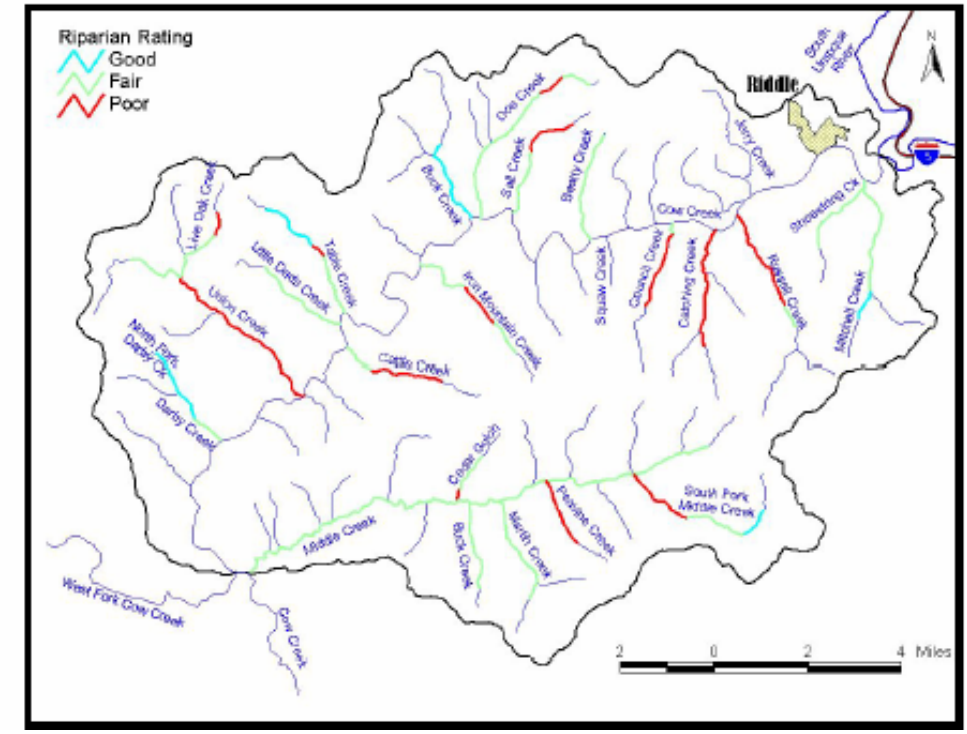
McCullough Subwatershed

- Seek alternative to runoff from industrial sites.
- Limit livestock access to riparian habitat and streams through riparian fencing, cattle crossings, off-channel watering, off-channel provision of shade, and cross fencing. Continue to use designated stream crossings and minimize number of crossings.

Riffle Subwatershed

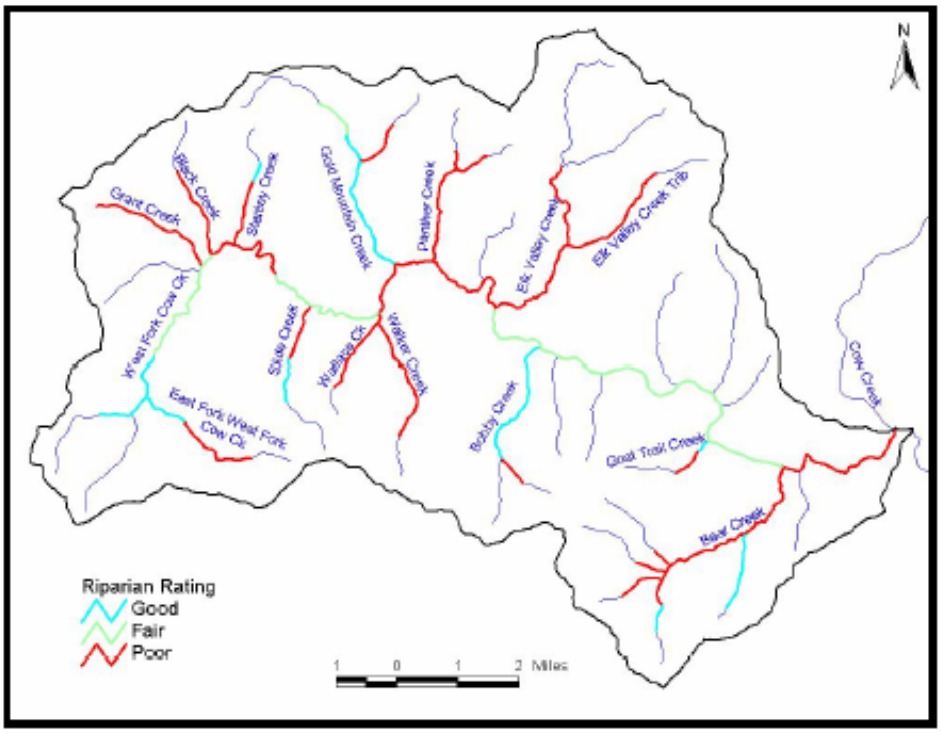
- Protect riparian areas that have a width of two or more trees.
- Increase canopy cover by planting trees in predominately brush riparian areas.
- Where feasible, establish conifers and other native vegetation in areas now dominated by blackberries and other invasive plant species, or which lack any tall vegetation.
- Manage the riparian areas for tree crown growth.
- Manage livestock so that they do not intrude on the riparian area.
- Plant native vegetation to establish a tall and dense shade wall along and over streams.
- Establish trees in brushy and open areas along the stream.
- Place large wood structures in the streams that accumulate gravels and create subsurface flows that can cool the water.
- Secure water right leases or purchase water rights for conversion to instream use in Quines, Windy, and the two Cow Creek Water Availability Basins.
- Improve irrigation efficiency.

Lower Cow Creek Watershed



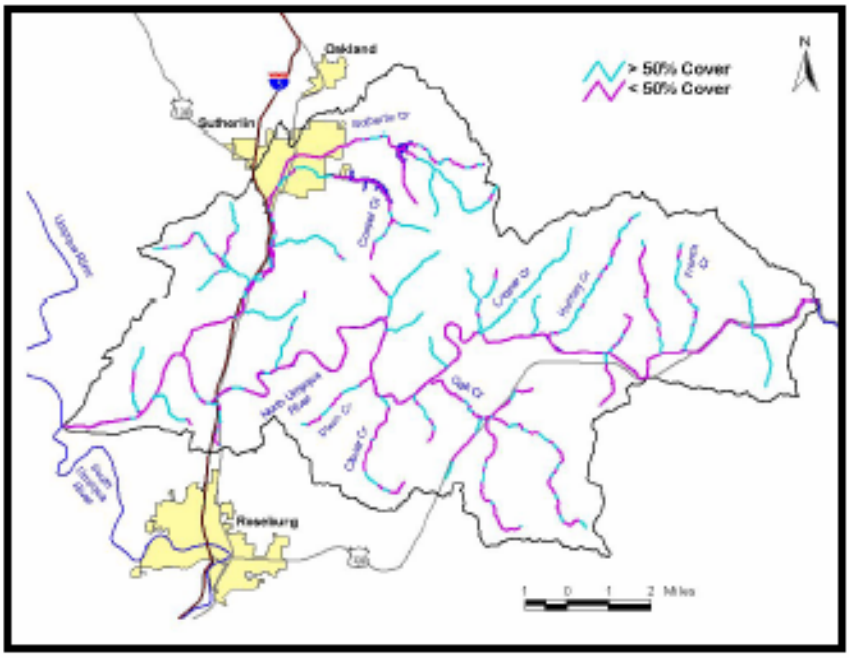
- Plant trees (especially conifers), remove blackberries, and fence riparian areas along Jerry Creek, Russell Creek, and Catching Creek, as well as at the mouths of other small tributaries flowing into Cow Creek. Install upland stock water systems as appropriate.
- Assist landowners willing to create or improve wetlands, especially where evidence suggests historical wetlands may have been located, such as Cooper Creek and the lower reaches of Cow Creek.
- Where canopy cover is less than 50%, establish wide buffers of native trees areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by grass, brush, and blackberry and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Where riparian buffers are one tree wide or less, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Maintain riparian zones that are two or more trees wide and provide more than 50% cover.
- Encourage best management practices that limit wetland damage, such as off-channel watering, hardened crossings, livestock exclusion (part or all of the year), and providing stream shade.
- Develop opportunities to increase awareness of what defines a wetland, its functions and benefits. This is a fundamental step in creating landowner interest and developing landowner appreciation for wetland conservation.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders.
- Establish an approachable “one-stop shop” or clearinghouse to assist landowners in enrolling in programs that can benefit wetlands and meet landowner goals.
- Reduce summer water consumption through instream water leasing and by improving irrigation efficiency.
- Educate landowners about proper irrigation methods and the benefits of improved irrigation efficiency.
- Continue monitoring peak flow trends in the watershed. Try to determine the role of vegetative cover, flooding, road density, and the TSZ on water volume.

West Fork Cow Creek Watershed



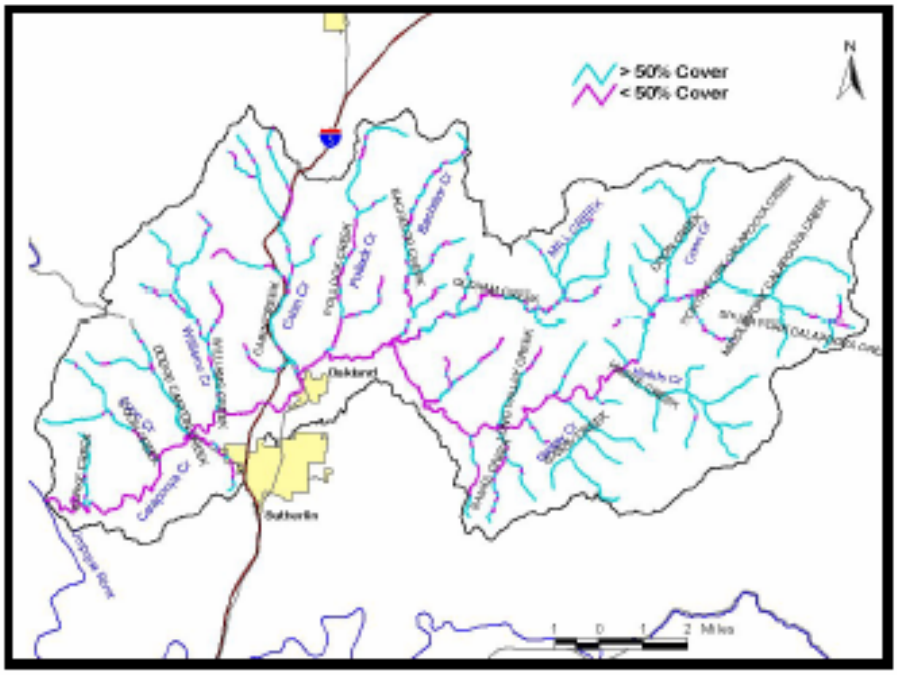
- Along West Fork Cow Creek, identify areas that may serve as "oases" for fish during the summer months, such as at the mouths of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve instream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- Where stream temperature is a concern, increase shade by encouraging wide riparian buffers and managing for full canopies.
- Identify the following riparian conditions from digital aerial photographs or from stream surveys:
- Streams segments where canopy cover is less than 50%. In these areas, establish wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams which more than 50% canopy cover is possible.
- Riparian zones dominated by brush/blackberry: Convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Riparian buffers that are one tree wide or less: In these areas, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Develop opportunities to increase awareness of what defines a wetland, its functions and benefits. This is a fundamental step in creating landowner interest and developing landowner appreciation for wetland conservation.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders.
- Continue monitoring peak flow trends in the watershed. Try to determine the role of vegetative cover, flooding, road density, and the TSZ on water volume.

Lower North Umpqua Watershed



- Improved irrigation efficiency and instream water leasing (all streams with water rights).
- Riparian planting, blackberry conversion, fencing, and alternative livestock watering systems (esp. Bradley Creek and Oak Creek and its tributaries).
- Work with Sutherlin Water Control District on future restoration opportunities.
- In riparian zones with vegetation or features that provide less than 50% canopy cover, establish a wide buffer of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which 50% or greater canopy cover is possible.
- Identify riparian zones dominated by blackberries and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Investigate methods of controlling blackberries, such as through biological control.
- Where riparian buffers are one tree wide or less, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Maintain riparian zones that are two or more trees wide and, along tributaries, provide more than 50% cover.
- Extensive wetland areas that currently exist in the Sutherlin area may be protected from further development in order to preserve the natural heritage of the area. Protected wetland areas may provide recreational opportunities for residents of Sutherlin in the form of wildlife viewing, and educational or interpretive information.
- Expand forested riparian zones and riverine wetlands by planting hydrophytic tree species in locations with appropriate conditions at a high density. Newly established forested riparian zones and riverine wetlands will provide buffer zones for the filtering of potentially water-quality-limiting substances prior to their entry into water bodies and wetlands.
- Educate policy makers, landowners, and community members on the importance of maintaining wetlands for healthy watersheds, and their educational, recreational, and aesthetic values for the local community.
- Identify stream reaches that may serve as “oases” for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams’ riparian buffers and, if appropriate, improve instream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams, encourage wide riparian buffers and manage for native trees and full canopies.
- Reduce summer water consumption through instream water leasing and by improving irrigation efficiency.
- Continue monitoring peak flow trends in the watershed.
- Educate landowners about proper irrigation methods and the benefits of improved irrigation.

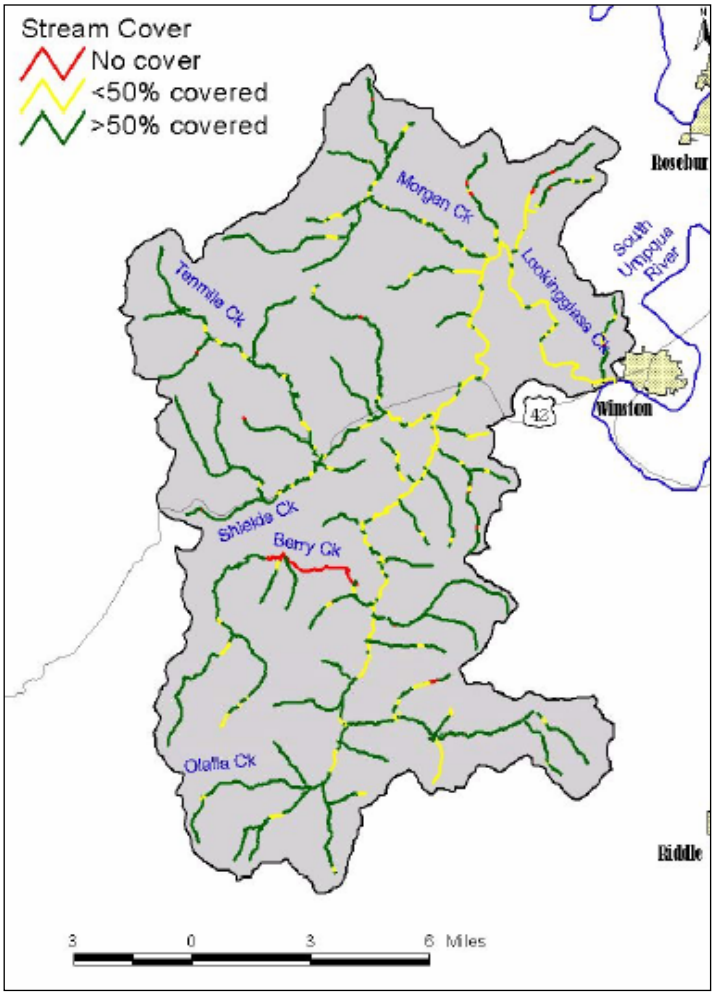
Calapooya Creek Watershed



- Riparian planting, blackberry conversion, fencing, and alternative livestock watering systems in the following areas:

  Calapooya Creek from Dodge Canyon to Oldham Creek; Oldham Creek; Pollock Creek; Cabin Creek; Williams/Norton Creek; and Bachelor Creek.
- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve instream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams or where pH and/or dissolved oxygen are a problem, increase shade by encouraging wide riparian buffers and managing for full canopies.
- Where canopy cover is less than 50%, establish wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams which more than 50% canopy cover is possible.
- Identify riparian zones dominated by blackberries and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Investigate methods of controlling blackberries, such as through biological control.
- Where riparian buffers are one tree wide or less, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Maintain riparian zones that are two or more trees wide and, along tributaries, provide more than 50% cover.
- Provide information to landowners explaining the benefits of restricting livestock access to streams, establishing buffer zones, the importance of wetlands within watersheds, and the effects of instream activities on downstream conditions.
- Promote public involvement in the maintenance of wetland resources by educating members of the local community as to the importance of maintaining natural heritage and diversity.
- Educate policy makers, landowners, and community members on the importance of maintaining wetlands for healthy watersheds, and their educational, recreational, and aesthetic values for the local community.
- Reduce summer water consumption through instream water leasing and by improving irrigation efficiency.
- Continue monitoring peak flow trends in the watershed. Try to determine the role of vegetative cover, flooding, road density, and the TSZ on water volume.
- Educate landowners about proper irrigation methods and the benefits of improved irrigation efficiency.

Olalla-Lookingglass Watershed:



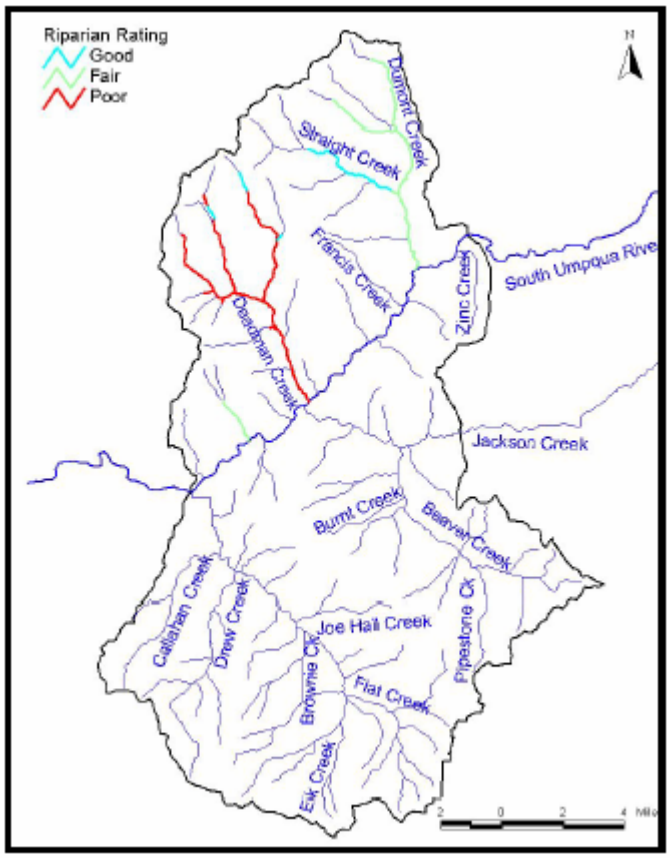
- Improving irrigation efficiency and encouraging instream water leasing on Lookingglass Creek, Olalla Creek, Morgan Creek, and Tenmile Creek.

- Riparian planting and fencing on the following streams:

Applegate Creek, Archambeau Creek, Byron Creek, Flournoy Creek, Larson Creek, Lookingglass Creek, Lookingglass Creek; unnamed tributary at northernmost bend,McNabb Creek, Morgan Creek, Olalla Creek, Perron Creek, Porter Creek, Rock Creek and tributaries, Shields Creek, Strickland Canyon, Tenmile Creek and, Thompson Creek

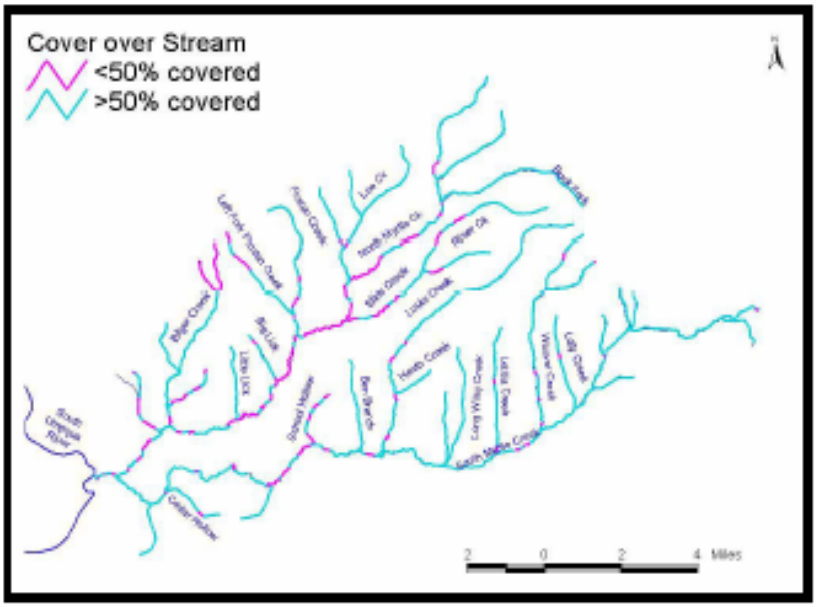
- Where canopy cover is less than 50%, establish wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are ones for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by blackberries and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Where riparian buffers are one tree width or less, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Investigate methods of controlling blackberries.
- Maintain riparian zones that are two or more trees wide and provide more than 50% cover.
- Provide information to landowners explaining the benefits of restricting livestock access to streams, establishing buffer zones, the importance of wetlands within watersheds, and the impacts on downstream conditions.
- Promote public involvement in the maintenance of wetland resources by educating members of the local community as to the importance of maintaining natural heritage and diversity.
- Increase public awareness of wetland functions that relate to wildlife habitat, endangered species preservation, aesthetic appeal, and water quality.
- Identify stream reaches that may serve as “oases” for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams’ riparian buffers and, if needed, improve in-stream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams or where pH and/or dissolved oxygen are a problem, increase shade by encouraging wide riparian buffers and managing for full canopies.
- Reduce summer water consumption through in-stream water leasing and by improving irrigation efficiency.

Tiller Region



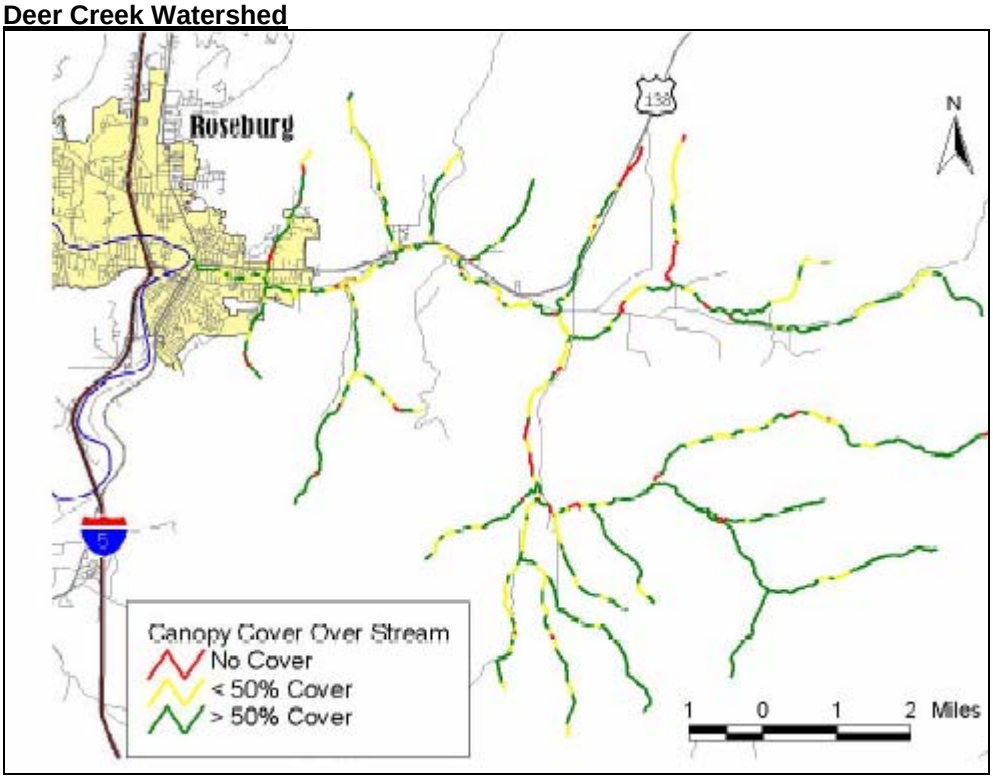
- Use ground surveys and, when available, digital aerial photographs to identify streams and stream reaches with narrow or simplified riparian zones, poor vegetation composition, or insufficient shade. Take the following action where appropriate:
  - Along poorly shaded streams or streams with narrow riparian zones, encourage wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams which more than 50% canopy cover is possible.
  - Where brush and blackberry are present, convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders. A restoration demonstration project on public land might be well received by local residents because of the high percentage of public land in the region.
- Establish an approachable “one-stop shop” or clearinghouse to assist landowners in enrolling in programs that can benefit wetlands and meet landowner goals.
- Identify stream reaches that may serve as “oases” for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams’ riparian buffers and, when appropriate, improve instream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams or where pH is a problem, increase shade by encouraging wide riparian buffers and managing for full canopies.
- Reduce summer water consumption through instream water leasing and by improving irrigation efficiency.
- Continue monitoring peak flow trends in the Tiller Region. Try to determine the role of vegetative cover, flooding, road density, and the TSZ on water volume.
- Educate landowners about proper irrigation methods and the benefits of improved irrigation efficiency.

Myrtle Creek Watershed



- Improving irrigation efficiency and encouraging instream water leasing on main stem Myrtle Creek, North Myrtle Creek, South Myrtle Creek, and tributaries with irrigation rights, including Bilger Creek, Frozen Creek, and Louis Creek.
- Riparian fencing/stockwater improvement on:
  Bilger Creek, Louis Creek, North Myrtle Creek, School Hollow Creek and, Slide Creek
- Where canopy cover is less than 50%, establish wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by blackberries and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Investigate methods of controlling blackberries.
- Where riparian buffers are one tree width or less, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Maintain riparian zones that are two or more trees wide and provide more than 50% cover.
- Provide information to landowners explaining the benefits of restricting livestock access to streams, establishing buffer zones, the importance of wetlands within watersheds, and the effects of downstream conditions.
- Promote public involvement in the maintenance of wetland resources by educating members of the local community as to the importance of maintaining natural heritage and diversity.
- Educate policy makers, landowners, and community members on the importance of maintaining wetlands for healthy watersheds, and their educational, recreational, and aesthetic values for the local community.
- Identify stream reaches that may serve as “oases” for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams’ riparian buffers and, if needed, improve in-stream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams or where pH and/or dissolved oxygen are a problem, increase shade by encouraging wide riparian buffers and managing for full canopies.
- Reduce summer water consumption through in-stream water leasing and by improving irrigation efficiency.
- Continue monitoring peak flow trends in the watershed. Try to determine the role of vegetative cover, flooding, road density, and the TSZ on water volume.
- Educate landowners about proper irrigation methods and the benefits of improved irrigation efficiency.

Deer Creek Watershed



South Side of Deer Creek, from the Urban Growth Boundary to the forks (14.5 miles of riparian area)

- Concentrate tree planting on sections with less than 50% cover (5.5 miles of riparian area).
- Much of this section is already fenced, enhance those riparian areas.
- Establish conifers and other native vegetation in areas now dominated by blackberries (1 mile of riparian area).
- Several fields on DaMotta Branch have opportunities for livestock management, cattle crossings, off-channel watering, riparian planting and/or spring grazing lots.
- Increase riparian areas on DaMotta Branch on poor agricultural lands as wetlands and flood control.

North Side of Deer Creek, from the Urban Growth Boundary to Buckhorn Road (11 miles of riparian area)

- Enhance extensive areas along Shick Creek that are currently blackberry or rangeland with trees (2 miles of riparian area).
- Enhance created wetlands on Shick Creek and past restoration activities on Shick Creek
- Enhance riparian areas in abandoned mill site.
- Pursue livestock management opportunities in three major tributary drainages, including off-channel watering and shade.
- Concentrate tree planting on sections with less than 50% cover (7 miles of riparian area).

North Side of Deer Creek, Buckhorn Road to the forks (11.5 miles of riparian area)

- Pursue livestock management opportunities; concentrate on moving feeding areas away from the creek and unstable areas, and education.
- Enhance riparian areas with tree planting.
- Promote confidential program to dye-test near-stream septic systems to check for failure.
- Mitigate effects of past riprap.

North Fork Deer Creek, mouth to Strader Road (17 miles of riparian area)

- Pursue developing log pond and wetlands area, plantings of wet meadows and native prairie, and combine with livestock management.
- Focus riparian planting on areas with less than 50% cover (9 miles of riparian area).

- Establish trees and other native vegetation in areas now dominated by blackberries (2.5 miles of riparian area).
- Enhance riparian area at O. C. Brown Park and use as a demonstration site for riparian health.
- Perform livestock management with riparian fencing, cattle crossings, off-channel watering, off-channel provision of shade, and cross fencing.
- Place large woody material in the stream (low priority).

North Fork Deer Creek, Strader Road to headwaters (7 miles of riparian area)

- Place large woody material in the stream (higher priority).
- Establish vegetation in areas where blackberries have been removed.
- Perform livestock management with riparian fencing, cattle crossings, off-channel watering, off-channel provision of shade and cross fencing.
- Promote confidential program to dye-test near-stream septic systems to check for failure (especially in the winter).
- Plant steep uplands with trees.

South Fork Deer Creek (68.5 miles of riparian area)

- Perform livestock management with riparian fencing, cattle crossings, off-channel watering, off-channel provision of shade, and cross fencing.
- Promote confidential program to dye-test near-stream septic systems to check for failure (especially in the winter).
- Establish trees and other native vegetation in areas now dominated by blackberries (2.5 miles of riparian area).
- Perform streambank erosion control emphasizing bioengineering techniques.
- Increase riparian areas on poor agricultural lands, that are often wet and cause foot diseases for livestock, or are borderline for hay production, as wetlands and flood control.
- Place large woody material in the stream on Middle Fork South Fork Deer Creek or South Fork Deer Creek above the confluence of Middle Fork South Fork Deer Creek.
- Plant steep uplands with trees.
- Encourage landowners to meter water intakes.

All areas:

- Protect riparian areas that have a width of two or more trees from being reduced in width.
- Increase canopy cover by planting trees in predominately brush riparian areas. Avoid full-scale exposure during the process.
- Where feasible, establish conifers and other native vegetation in areas now dominated by blackberries, and other invasive plant species or no tall plants at all.
- Manage the riparian areas for tree crown growth.
- Manage livestock so that they are not intrusive to the riparian area
- Plant native vegetation.
- Establish a tall and dense shade wall along the streams.
- Use selective thinning to encourage full crowns.
- Establish trees in open and brushy areas along the stream.
- Secure water right leases or purchase water rights for conversion to instream use.
- Improve irrigation
- Develop zoning policy that encourages an effective riparian shade buffer that is tall and dense, and leaving appropriate channel structure.
- Improve current riparian areas.

Rock Creek Region:

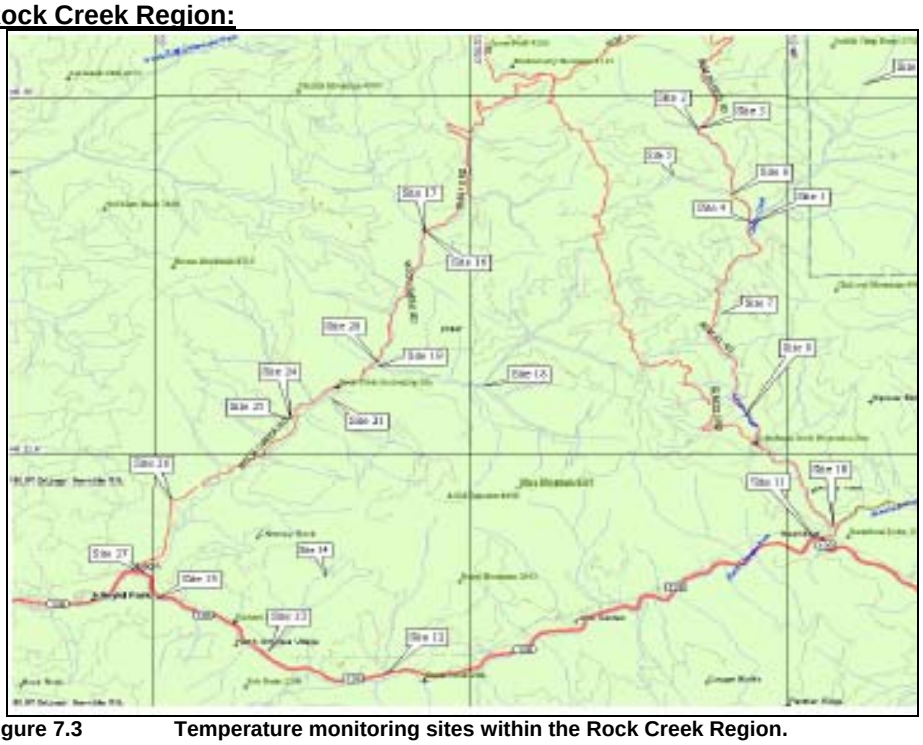
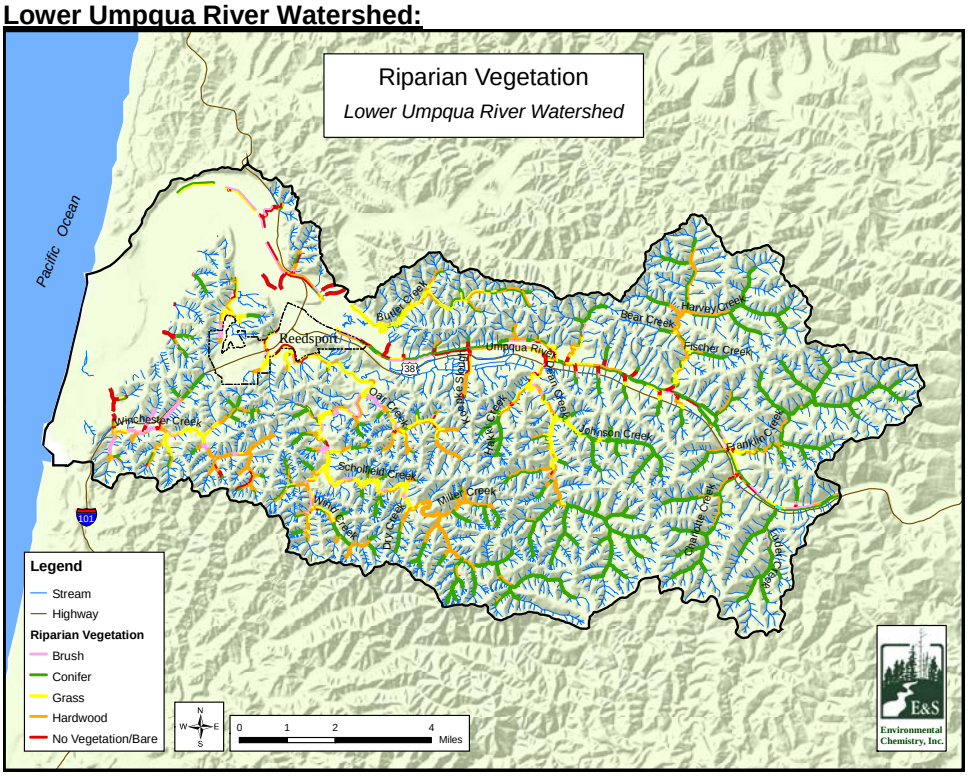


Figure 7.3 Temperature monitoring sites within the Rock Creek Region.

- Continue monitoring the Rock Creek Region for all water quality conditions. Expand monitoring efforts to include small tributaries.
- Identify stream reaches that may serve as "oases" for fish during the warm summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve instream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel. Possible tributaries include: Kelly, Miller, Woodstock, and East Fork Rock creeks in the Rock Creek Watershed and Pass, Scaredman, Trapper, and Mellow Moon creeks in the Canton Creek Watershed. Susan Creek and Honey Creek are not much cooler than the North Umpqua River but may serve as shelter during peak flow events.
- In very warm streams, increase shade by encouraging wide riparian buffers and managing for full canopies.
- Encourage landowners to protect intact riparian areas along tributary channels that are cooler than the main channel and work with adjacent landowners to develop more contiguous riparian cover along the tributaries.
- Identify tributaries with bedrock substrate to focus riparian management and develop more gravel with instream wood placement to encourage cooler temperatures where appropriate.
- Ensure riparian areas harvested prior to 1972 are regenerated and fully stocked. Incorporate a mix of appropriate riparian species to enhance diversity.
- Review younger stands for thinning options to expedite growth of tree crowns and diameters. Consider tree girdling especially right near the stream edge where areas may be sensitive to disturbance.
- Remove or control noxious weeds in recently harvested riparian areas and along roads adjacent to riparian areas. This will speed up forest establishment and growth, and maintain plant diversity in the riparian areas.
- Prioritize efforts on smaller streams with anadromous fish presence where channel widths can be more heavily shaded by riparian cover. Target areas at the junctions of tributaries with the main channels where anadromous fish use is heavy and channel width and water velocity is lower than in the main streams such as Rock Creek.
- On larger streams with unconfined sections such as Rock Creek, consider adding coarse wood within the floodplain riparian zone. Consider planting to add diversity of species including conifer back into alder dominated areas. Combine riparian work with areas where instream work may be warranted.

- Identify areas along Canton, Pass, Rock, Harrington, Miller, and East Fork Rock creeks that would benefit from riparian improvement or protection to reduce stream warming in the summer months, and reduce erosion and water velocity during peak flows.
- Work with ODFW and PacifiCorp to find matching sources of funds to help pay for conservation easements and work with landowners to develop interest in the program.
- Encourage private landowners to maintain healthy riparian and wetland sections through education and promoting land easements.
- Inventory wetlands for noxious weed problems that can be included in the programs for noxious weed control.
- Plant wetland species into areas where invasive plants have been removed to promote wetland species establishment.
- Avoid wetlands with new road construction.
- Develop opportunities to increase awareness of what defines a wetland, its functions and benefits. This is a fundamental step in creating landowner interest and developing landowner appreciation for wetland conservation.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders.
- Establish an approachable “one-stop shop” or clearinghouse to assist landowners in enrolling in programs that can benefit wetlands and meet landowner goals.

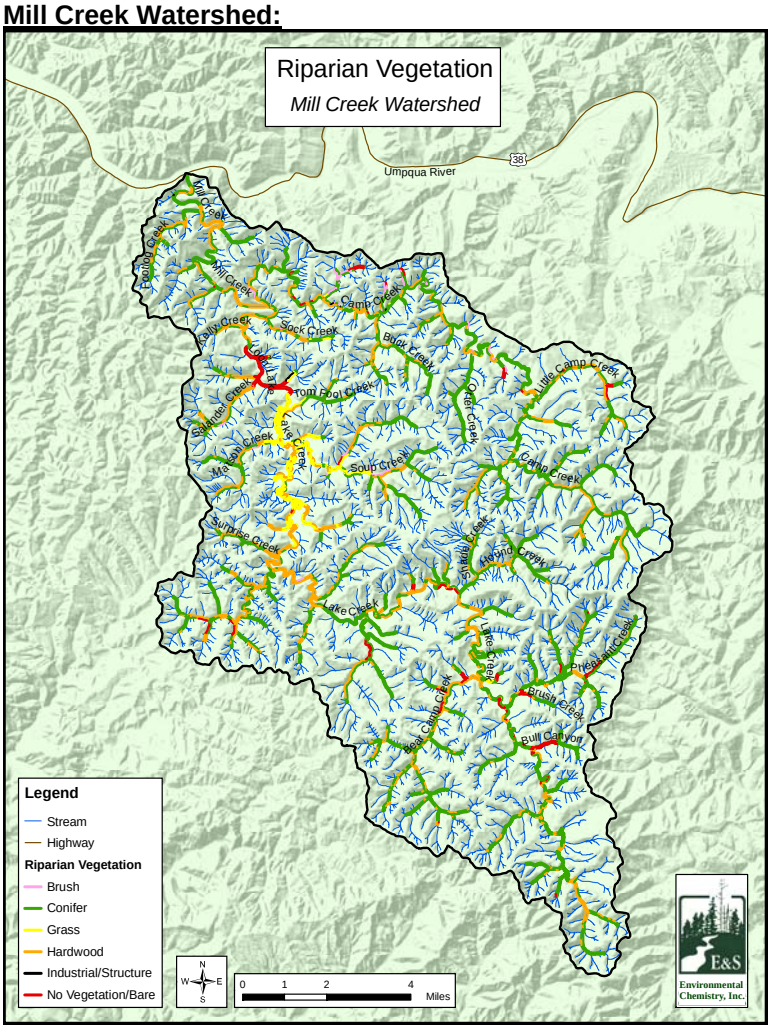
Lower Umpqua River Watershed:



- Continue monitoring the Middle Umpqua River Watershed for water quality conditions. Expand monitoring efforts to include more monitoring of tributaries.
- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve in-stream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams, increase shade by encouraging development of riparian buffers and managing for full stream canopy coverage.
- Where canopy cover is less than 50%, establish buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by grass and blackberry and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Where possible, maintain riparian zones that are two or more trees wide and provide more than 50% cover.
- Encourage best management practices that limit wetland damage, such as off-channel watering, hardened crossings, and livestock exclusion (part or all of the year), and provide stream shade.
- Develop opportunities to increase awareness of what defines a wetland and its functions and benefits. This is a fundamental step in creating landowner interest and developing landowner appreciation for wetland conservation.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders.
- Establish an approachable clearinghouse to assist landowners in enrolling in programs that can benefit wetlands and meet landowner goals. A friendly and "non-governmental" atmosphere can reduce some of the previously identified landowner concerns. A central site can identify and coordinate partners, streamline landowner paperwork, and facilitate securing funding and in-kind services often needed for a successful project. Combining local programs with national programs maximizes flexibility and funding. For example, a landowner could receive a tax exemption under the local Wildlife Habitat Conservation and Management Program, receive technical assistance in planning and cost share from the Natural

Resources Conservation Service, and receive grant money from Partners for Wildlife and Ducks Unlimited.

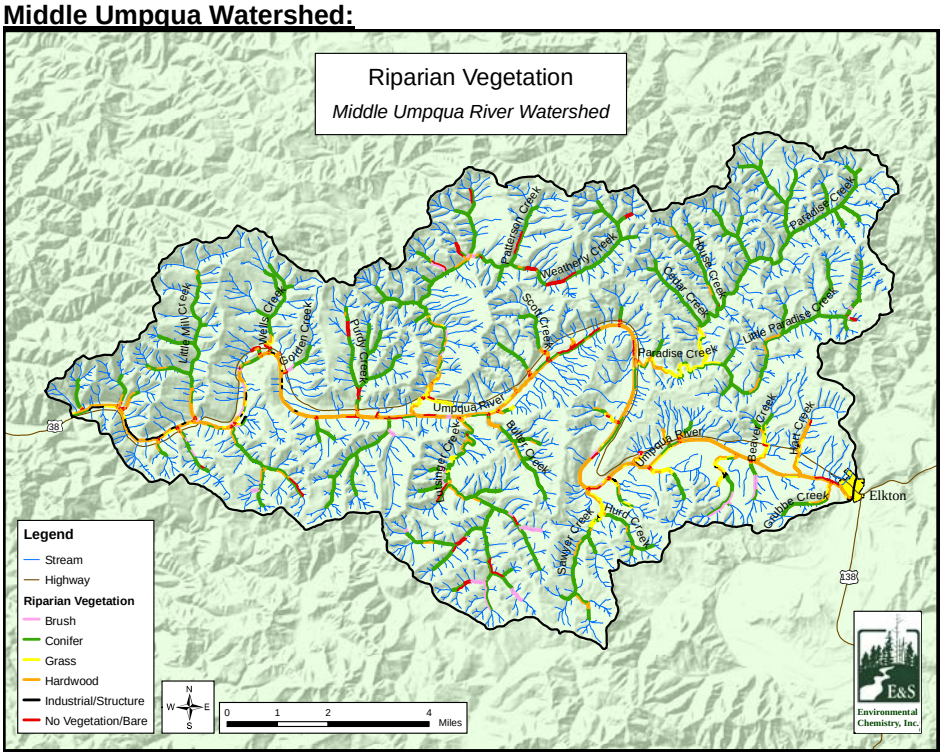
Mill Creek Watershed:



- Continue monitoring the Mill Creek Watershed for water quality conditions. Expand monitoring efforts to include more monitoring of tributaries.
- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve in-stream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams, increase shade by encouraging development of riparian buffers and managing for full stream canopy coverage.
- Where appropriate, improve pools and riffles while increasing in-stream large woody material by placing large wood and/or boulders in streams with channel types that are responsive to restoration activities and have an active channel less than 30 feet wide.
- Encourage land use practices that enhance or protect riparian areas:
  - Protect riparian areas from livestock-caused browsing and bank erosion by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
  - Plant native riparian trees, shrubs, and understory vegetation in areas with poor or fair riparian area conditions.

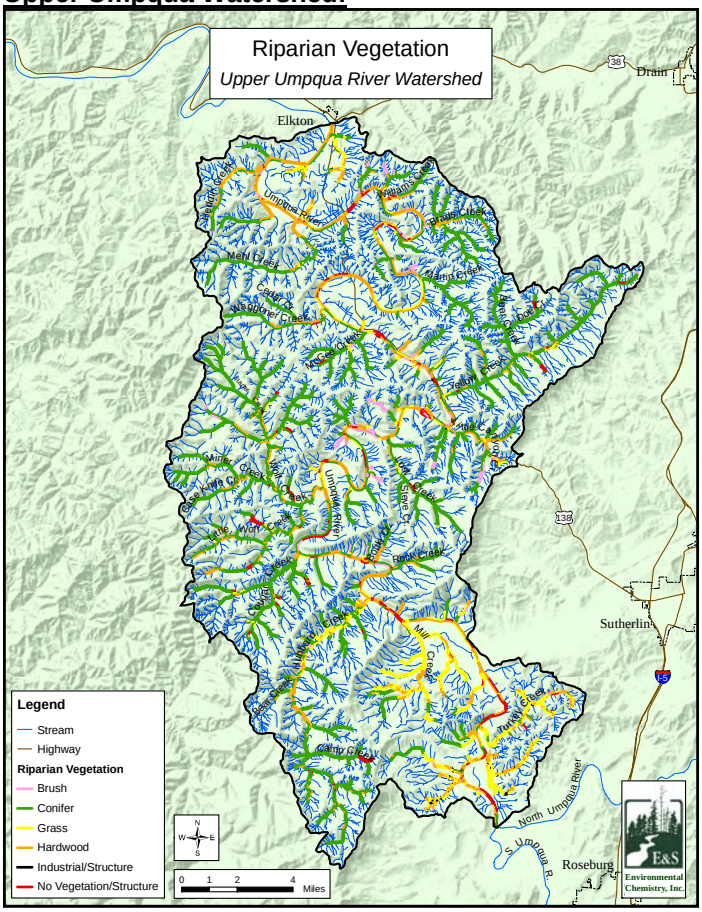
  - Manage riparian zones for uneven-aged stands with large diameter trees and younger understory trees.
  - Maintain areas with good native riparian vegetation.
- Where canopy cover is less than 50%, establish buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by grass and blackberry and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Where possible, maintain riparian zones that are two or more trees wide and provide more than 50% cover.
- Encourage best management practices that limit wetland damage, such as off-channel watering, hardened crossings, livestock exclusion (part or all of the year), and provide stream shade.
- Develop opportunities to increase awareness of what defines a wetland and its functions and benefits. This is a fundamental step in creating landowner interest and developing landowner appreciation for wetland conservation.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders.
- Establish an approachable clearinghouse to assist landowners in enrolling in programs that can benefit wetlands and meet landowner goals. A friendly and "non-governmental" atmosphere can reduce some of the previously identified landowner concerns. A central site can identify and coordinate partners, streamline landowner paperwork, and facilitate securing funding and in-kind services often needed for a successful project. Combining local programs with national programs maximizes flexibility and funding. For example, a landowner could receive a tax exemption under the local Wildlife Habitat Conservation and Management Program, receive technical assistance in planning and cost share from the Natural Resources Conservation Service, and receive grant money from Partners for Wildlife and Ducks Unlimited.

Middle Umpqua Watershed:



- Continue monitoring the Middle Umpqua River Watershed for water quality conditions. Expand monitoring efforts to include more monitoring of tributaries.
- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve in-stream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams, increase shade by encouraging development of riparian buffers and managing for full stream canopy coverage.
- Where canopy cover is less than 50%, establish buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by grass and blackberry and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Where possible, maintain riparian zones that are two or more trees wide and provide more than 50% cover.
- Encourage best management practices that limit wetland damage, such as off-channel watering, hardened crossings, livestock exclusion (part or all of the year), and provide stream shade.
- Develop opportunities to increase awareness of what defines a wetland and its functions and benefits. This is a fundamental step in creating landowner interest and developing landowner appreciation for wetland conservation.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders.
- Establish an approachable clearinghouse to assist landowners in enrolling in programs that can benefit wetlands and meet landowner goals. A friendly and "non-governmental" atmosphere can reduce some of the previously identified landowner concerns. A central site can identify and coordinate partners, streamline landowner paperwork, and facilitate securing funding and in-kind services often needed for a successful project. Combining local programs with national programs maximizes flexibility and funding. For example, a landowner could receive a tax exemption under the local Wildlife Habitat Conservation and Management Program, receive technical assistance in planning and cost share from the Natural Resources Conservation Service, and receive grant money from Partners for Wildlife and Ducks Unlimited.

Upper Umpqua Watershed:



- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve in-stream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams, increase shade by encouraging development of riparian buffers and managing for full stream canopy coverage.
- Where canopy cover is less than 50%, establish buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by grass and blackberry and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Where possible, maintain riparian zones that are two or more trees wide and provide more than 50% cover.

- Encourage best management practices that limit wetland damage, such as off-channel watering, hardened crossings, livestock exclusion (part or all of the year), and provide stream shade.
- Develop opportunities to increase awareness of what defines a wetland and its functions and benefits. This is a fundamental step in creating landowner interest and developing landowner appreciation for wetland conservation.
- Identify or establish various peer-related demonstration projects as opportunities to educate stakeholders.
- Establish an approachable clearinghouse to assist landowners in enrolling in programs that can benefit wetlands and meet landowner goals. A friendly and "non-governmental" atmosphere can reduce some of the previously identified landowner concerns. A central site can identify and coordinate partners, streamline landowner paperwork, and facilitate securing funding and in-kind services often needed for a successful project. Combining local programs with national programs maximizes flexibility and funding. For example, a landowner could receive a tax exemption under the local Wildlife Habitat Conservation and Management Program, receive technical assistance in planning and cost share from the Natural Resources Conservation Service, and receive grant money from Partners for Wildlife and Ducks Unlimited.

Bacteria

The Umpqua Basin TMDL Technical Committee responses to an early draft of the bacteria TMDL recommended that implementation focus on the South Umpqua River during the summer due to the much higher incidence of exposure when bacteria levels are above standards. Another important priority for bacteria TMDL implementation is the estuary due to the presence of the shellfish, with both commercial and recreational harvests which provide economic benefits to the region.

With the exception of accidents and bypasses, wastewater treatment plants which are operating properly do not generally discharge bacteria that would result in a violation of water quality standards. In a few cases, inadequate capacity for sewage treatment and/or problems from inflow and infiltration have resulted in bacteria problems from those wastewater treatment plants. These plants are at various stages in the process of upgrading and repairing their treatment facilities. With these few exceptions, the TMDL identifies nonpoint sources, not wastewater treatment plants, as the major contributors to bacterial pollution.

Storm sampling conducted by DEQ in the Calapooya Creek and Deer Creek watersheds in 2002 suggests that water flowing off forest land is not a significant source of bacterial contamination. Efforts to address bacteria should be focused instead on other land uses: agriculture, rural residential, and urban.

I. Monitoring – Source Identification

Because the precise source of fecal bacteria contamination is difficult to isolate through routine testing, the strategy to address bacteria begins with further investigation into potential nonpoint sources. Currently efforts are underway in three watersheds to more clearly define where bacteria are coming from:

- In the Smith River watershed, both DEQ and the Smith River Watershed Council have conducted bacteria sampling, as well as DNA testing to determine the host of the *E. coli* bacteria found in the sampling, which encompasses the estuary and lower Umpqua River as well as the Smith River. Unfortunately, the study year was extremely dry, so the study did not provide adequate information for the higher flow times that the TMDL load allocations are in effect;
- In the Myrtle Creek watershed, the Partnership for the Umpqua Rivers is conducting bacteria sampling to help identify sources contributing to the high bacteria levels that led to DEQ's recent listing of Myrtle Creek for bacteria standard violations;
- Throughout the Calapooya watershed, trained volunteer water quality monitors are collecting data to help understand the sources of bacteria which have led to the 303(d) listing of Calapooya Creek.

II. Bacteria Control Strategies

A. Agriculture

Senate Bill 1010 is the process used by the Oregon Department of Agriculture to address water quality issues on agricultural lands. Once load allocations are finalized, it will be that Department's responsibility to ensure that implementation of the Agricultural Water Quality Management Area Plan will result in the achievement of the load allocation.

B. Rural Residential

Potential bacteria sources on rural residential land include domestic animals and pets, livestock, failing onsite sewage disposal systems, and wildlife. Local jurisdictions and DEQ have jurisdiction regarding septic systems, although in the Umpqua Basin DEQ is the primary agency dealing with onsite sewage disposal systems. Education is the initial step in dealing with bacteria from rural residential lands.

C. Urban Storm water

Urban Storm water generally contains a variety of pollutants, including bacteria, nutrients, and metals and toxics. In the Umpqua Basin, recent bacteria's testing has shown that bacteria are of concern in urban storm water systems and urban streams. It is likely that other pollutants are present as well, so that some methods of managing for bacteria will likely have the additional benefit of reducing inputs of other pollutants.

In its assessment of seven urban areas in the Umpqua Basin, the Partnership for the Umpqua Rivers estimated the percentage of the total urban growth area which consisted of impervious areas. See Table 7.6 below for the results.

Table 7.6 Umpqua Basin Cities, Population, Land Use and Impervious Area

Urban Growth Boundary	Population July 2003	% commercial, industrial or residential area	Dominant type of land use	Estimate of % total impervious area
Canyonville	1,410	78%	Urban	35%
Drain	1,060	76%	Residential	36%
Glendale	860	90%	Residential	27%
Myrtle Creek	3,480	74%	Residential	34%
Oakland	940	88%	Residential	38%
Riddle	1,020	67%	Residential	21%
Roseburg	20,480	75%	Residential	42%
Sutherlin	7,300	76%	Residential	38%
Winston	4,940	39%	Residential	18%
Yoncalla	1,080	93%	Residential	48%

Source: Partnership for the Umpqua Rivers.; Source of population figures: League of Oregon Cities, Oregon City Populations, July, 2003.

Urban storm water is governed by EPA/ DEQ's Municipal Separate Storm Sewer System (MS4) discharge control measures. There are three levels to this system, only one of which is currently applicable in the Umpqua Basin.

- Level One requires a permit from DEQ and applies to jurisdictions with a population size of 100,000 or more. There are no Level One jurisdictions in the Umpqua Basin.
- Level Two applies to jurisdictions in urbanized areas over 50,000 in population. There are no Level Two jurisdictions in the Umpqua Basin.
- Level Three applies to Designated Management Agencies that have jurisdiction over storm water with a population size ranging up to 50,000 but not covered by Levels One or Two.

  These DMAs must develop a storm water management component that addresses any appropriate control measure that is relevant for the community as part of their TMDL Implementation Plan. This is the level applicable to the Umpqua Basin.

For all DMAs, the TMDL Implementation Plan shall include information as to the extent of the problem and the actions that will be taken. DMAs having a population of 10,000 to 50,000 (only the City of Roseburg at the present time) must address the following six minimum control measures in the storm water management component of the TMDL Implementation Plan. Smaller DMAs with populations of 10,000 or less should give consideration to any of these six control measures that are relevant. The six control measures are listed below:

Control Measures

1. Pollution Prevention in Municipal Operations

a. The DMA must develop and implement an operations and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations; and

b. Using training materials that are available from the Department (DEQ), USEPA, or other organizations, the DMA's program must include employee training to prevent and reduce storm water pollution from activities including, but not limited to, park and open space maintenance, fleet and building maintenance, new municipal facility construction and related land disturbances, design and construction of street and storm drain systems, and storm water system maintenance.

2. Public Education and Outreach on Storm Water Impacts

The DMA must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.

3. Public Involvement/Participation

The DMA must at a minimum, comply with State, Tribal, and local public notice requirements when implementing a public involvement/participation program.

4. Illicit Discharge Detection and Elimination

The DMA must:

a. Develop, implement and enforce a program to detect and eliminate illicit discharges [as defined in 40 CFR Section 122.26(b) (2)] into the DMA's system;

b. Develop, if not already completed, a storm sewer system map, showing the location of outfalls and the names and location of all waters of the United States an/or the State of Oregon that receive discharges from those outfalls;

c. To the extent allowable under State or local law, effectively prohibit, through ordinance or other regulatory mechanisms, non-storm water discharges into the DMA's storm sewer system and implement appropriate enforcement procedures and actions. Possible sanctions include non-monetary penalties (such as stop work orders), fines, bonding requirements, and/or permit denials for noncompliance;

d. Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to the DMA's system;

e. Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste; and

f. Address the following categories of non-storm water discharges or flows (illicit discharges) if the DMA identifies them as substantial contributors of pollutants to the DMA's system: water line flushing, landscape irrigation, diverted streams flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR Section 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car-washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water. Discharges or flows from fire fighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as substantial sources of pollutants to waters of the United States and the State of Oregon.

g. The DMA must develop a process to respond to and document complaints relating to illicit discharges.

5. Construction Site Storm Water Runoff Control

The DMA must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the DMA's system from construction activities that result in a land disturbance of greater than or e1qual to one acre. Reduction of storm water discharges from construction activity disturbing less than one acres must be included in the DMA's program if that construction activity is part of a larger

common plan of development or sale that would disturb one acre or more. The DMA's program must include the development and implementation of, at a minimum:

a. An ordinance or other regulatory mechanism to require erosion and sediment control, as well as sanctions to ensure compliance, to the extent allowable under State or local law;

b. Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;

c. Requirements for construction site operators to prevent or control waste that may cause adverse impacts to water quality such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site;

d. Procedures for site plan review that incorporate measures to prevent or control potential water quality impacts;

e. Procedures for receipt and consideration of information submitted by the public;

f. Procedure for site inspection and enforcement of control measures.

6. Post-Construction Storm Water Management in New Development and Redevelopment

The DMA must:

a. Develop, implement, and enforce a program to ensure reduction of pollutants in storm water runoff from new development and redevelopment projects that disturb one acre or more, or less than one acre if they are part of a larger common plan of development or sale, and discharge into the DMA's system. The DMA's program must ensure that controls are in place that would prevent or minimize water quality impacts.

b. Develop and implement strategies that include a combination of structural or non-structural BMPs appropriate for the DMA's community, and

i. Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law;

ii. Ensure adequate long-term operation and maintenance of BMPs; and

III. Ensure adequate enforcement of ordinance or alternative regulatory program.

III. Partnership for the Umpqua Rivers Action Plan Recommendations

The following recommendations are excerpted from the various Partnership for the Umpqua Rivers Watershed Assessment and Action Plans, discussed in the Temperature section above, and available on the internet at http://www.UmpquaRivers.org/. The documents themselves contain many more recommendations relevant to watershed health, as well as an excellent compendium of known data and information about each watershed, its history, past conditions and landowner viewpoints.

These recommendations are offered as the most appropriate starting points and priority areas for implementation of the bacteria load allocations.

South Umpqua River Watershed

- Plant trees (especially conifers), remove blackberries, and fence riparian areas along Coffee Creek, Days Creek, Stinger Gulch, Wood Creek, and Beals Creek. Install upland stock water systems as appropriate.
- Encourage landowner practices that will maintain the South Umpqua River Watershed's low bacteria and nutrient levels:
- Limit livestock stream access by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
- Relocate structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense and wide riparian vegetation zones to filter fecal material.
- Repair failing septic tanks and drain fields.

Middle South Umpqua Watershed

Identify and monitor sources of bacteria, nutrients, and ammonia. Where applicable, reduce bacteria, nutrient, and ammonia levels through activities such as:

- Limiting livestock stream access by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
- Relocating structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense and wide riparian vegetation zones to filter fecal material.
- Repairing failing septic tanks and drain fields.

Middle Cow Creek Watershed

Woodford/ Fortune Branch Subwatershed

- Limit livestock access to riparian habitat and streams through riparian fencing (some areas are already fenced), cattle crossings, off-channel watering, off-channel provision of shade, and cross fencing. Continue to use designated stream crossings and minimize number of crossings.

Windy Subwatershed

- Limit livestock access to riparian habitat and streams through riparian fencing, cattle crossings, off-channel watering, off-channel provision of shade, and cross fencing. Continue to use designated stream crossings and minimize number of crossings.

McCullough Subwatershed

- Limit livestock access to riparian habitat and streams through riparian fencing, cattle crossings, off-channel watering, off-channel provision of shade, and cross fencing. Continue to use designated stream crossings and minimize number of crossings.

Olalla-Lookingglass Watershed

- The Olalla-Lookingglass Watershed Assessment and Action Plan recommended the promotion of off-channel stock management and the provision of educational opportunities for management of stock wastes on the following creeks:

  Archambeau Creek, Flournoy Creek, Lookingglass Creek, McNabb Creek,Morgan Creek, Olalla Creek, Perron Creek, Porter Creek, Shields Creek and, Tenmile Creek
- In addition to stock management, the Action Plan recommended the fencing and planting of the riparian areas of all of these streams, as well as others. A well-functioning riparian area will assist with bacteria filtration in addition to its other water quality benefits.
- Identify and monitor point and non-point sources of bacteria and nutrients in the watershed. Where applicable, reduce nutrient levels through activities such as:
  - Limiting livestock stream access by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
  - Relocating structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense and wide riparian vegetation zones to filter fecal material.
  - Repairing failing septic tanks and drain fields.

Calapooya Creek Watershed

Identify and monitor sources of bacteria and nutrients in the watershed. Where applicable, reduce nutrient levels through activities such as:

- Limiting livestock stream access by providing stock water systems and shade trees outside of the stream channel and riparian zones.
- Fence riparian areas as appropriate.
- Relocating structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense and wide riparian vegetation zones to filter fecal material.
- Repairing failing septic tanks and drain fields.
- Educate landowners about water quality concerns and potential improvement methods including planting bio-swales near streams in urban and suburban areas to catch urban runoff.

Upper Cow Creek Watershed

Encourage landowner practices that will maintain the Upper Cow Creek Watershed's low nutrient levels:

- Limit livestock stream access by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
- Relocate structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense and wide riparian vegetation zones to filter fecal material.
- Repair failing septic tanks and drain fields.

Lower Cow Creek Watershed

- Plant trees (especially conifers), remove blackberries, and fence riparian areas along Jerry Creek, Russell Creek, and Catching Creek, as well as at the mouth of other small tributaries flowing into Cow Creek. Install upland stock water systems as appropriate.
- Encourage landowner practices that will maintain the Lower Cow Creek Watershed's low bacteria and nutrient levels:
- Limit livestock stream access by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
- Relocate structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense and wide riparian vegetation zones to filter fecal material.
- Repair failing septic tanks and drain fields.

Tiller Region

Maintain the Tiller Region's low nutrient levels through the following activities:

- Limit livestock stream access by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
- Relocate structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense and wide riparian vegetation zones to filter fecal material.
- Repair failing septic tanks and drain fields.

Myrtle Creek Watershed

- Riparian fencing/stockwater improvements on:
  Bilger Creek, Louis Creek, North Myrtle Creek, School Hollow Creek and, Slide Creek

Deer Creek Watershed

Bacteria Action Recommendations:

- Use off-channel watering for livestock to keep the livestock from defecating near or in the stream.
- Fence areas along the streams to keep the livestock from defecating near or in the stream.
- Check septic tanks and drainfields.
- Remove pet waste by collecting and properly disposing it.
- Maintain buffer strips along streams which filter water entering the creek (although buffer strips alone cannot remove all bacteria from a large source).

South Side of Deer Creek, from the Urban Growth Boundary to the forks:

- Several fields on DaMotta Branch have opportunities for livestock management, cattle crossings, off-channel watering, riparian planting and/or spring grazing lots.

North Side of Deer Creek, from the Urban Growth Boundary to Buckhorn Road:

- Pursue livestock management opportunities in three major tributary drainages, including off-channel watering and shade.

North Side of Deer Creek, Buckhorn Road to the forks:

- Pursue livestock management opportunities, concentrate on moving feeding areas away from the creek and unstable areas, and education.
- Promote confidential program to dye-test near-stream septic systems to check for failure.

North Fork Deer Creek, mouth to Strader Road:

- Perform livestock management with riparian fencing, cattle crossings, off-channel watering, off-channel provision of shade and cross fencing.
- Promote confidential program to dye-test near-stream septic systems to check for failure (especially in the winter).

South Fork Deer Creek:

- Perform livestock management with riparian fencing, cattle crossings, off-channel watering, off-channel provision of shade, and cross fencing.
- Promote confidential program to dye-test near-stream septic systems to check for failure (especially in the winter).

Mill Creek Watershed:

- Continue monitoring the Rock Creek Region for all water quality conditions. Expand monitoring efforts to include small tributaries.
- Encourage landowner practices that will maintain the Rock Creek Region's low nutrient and bacteria levels:
  - Repair failing septic tanks and drain fields.
  - Use wastewater treatment plant effluent for irrigation.

Lower Umpqua River Watershed:

- Encourage landowner practices that will reduce the Lower Umpqua River Watershed's bacteria levels:
  - Limit livestock access to streams by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
  - Relocate structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense riparian vegetation zones to filter fecal material.
  - Repair failing septic tanks and drain fields.
- In areas with high debris flow hazards and/or with soils that have high K-factor values and are in the C or D hydrologic group, encourage landowners to identify the specific soil types on their properties and include soils information in their land management plans.

Middle Umpqua River Watershed:

- Encourage landowner practices that will reduce the Middle Umpqua River Watershed's bacteria levels:
  - Limit livestock access to streams by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
  - Relocate structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense riparian vegetation zones to filter fecal material.
  - Repair failing septic tanks and drain fields.
- In areas with high debris flow hazards and/or with soils that have high K-factor values and are in the C or D hydrologic group, encourage landowners to identify the specific soil types on their properties and include soils information in their land management plans.
- Monitor bacteria concentrations in the mainstem river to determine whether water quality standards are being met.

Upper Umpqua River Watershed:

- Continue monitoring the Upper Umpqua River Watershed for water quality conditions, especially bacteria in the mainstem Umpqua River. Expand monitoring efforts to include more monitoring of tributaries.
- Encourage landowner practices that will reduce the bacteria levels:

- o Limit livestock stream access by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
- o Relocate structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense riparian vegetation zones to filter fecal material.
- o Repair failing septic tanks and drain fields.

- In areas with high debris flow hazards and/or with soils that have high K-factor values and are in the C or D hydrologic group, encourage landowners to identify the specific soil types on their properties and include soils information in their land management plans.

Rock Creek Region

- Encourage landowner practices that will maintain the Rock Creek Region's low nutrient and bacteria levels:
  - o Repair failing septic tanks and drain fields.
  - o Use wastewater treatment plant effluent for irrigation.
  - o Reduce chemical nutrient sources.

Component 4: Timeline for Implementation

The purpose of this element of the WQMP is to demonstrate a strategy for implementing and maintaining the plan and the resulting water quality improvements over the long term. Included in this section are timelines for the implementation of DEQ activities. Each DMA-specific Implementation Plan will also include timelines for the implementation of the milestones described earlier. Timelines should be as specific as possible and should include a schedule for BMP installation and/or evaluation, monitoring schedules, reporting dates and milestones for evaluating progress.

The DMA-specific Implementation Plans are designed to reduce pollutant loads from sources to meet TMDLs, associated loads and water quality standards. DEQ recognizes that where implementation involves significant habitat restoration or reforestation, water quality standards may not be met for decades. In addition, DEQ recognizes that technology for controlling nonpoint source pollution is, in some cases, in the development stages and will likely take one or more revisions to develop effective techniques.

For some Umpqua Basin TMDLs, pollutant surrogates have been defined as alternative targets for meeting the TMDL for some parameters. The purpose of the surrogates is not to bar or eliminate human access or activity in the watersheds or their riparian areas. It is the expectation, however, that the Implementation Plans will address how human activities will be managed to achieve the surrogates. It is also recognized that full attainment of pollutant surrogates (system potential vegetation, for example) at all locations may not be feasible due to physical, legal or other regulatory constraints. To the extent possible, the Implementation Plans should identify potential constraints, but should also provide the ability to mitigate those constraints should the opportunity arise. For instance, at this time, the existing location of a road or highway may preclude attainment of system potential vegetation due to safety considerations. In the future, however, should the road be expanded or upgraded, consideration should be given to designs that support TMDL load allocations and pollutant surrogates such as system potential vegetation.

DEQ intends to regularly review progress of the Implementation Plans. The plans, this overall WQMP, and the TMDLs are part of an adaptive management process. Modifications to the WQMP and the Implementation Plans are expected to occur on an annual or more frequent basis. Review of the TMDLs are expected to occur approximately five years after the final approval of the TMDLs, or whenever deemed necessary by DEQ.

Component 5: How Management Strategies Will Result in Meeting Water Quality Standards

Permit programs include specific discharge limitations and compliance schedules that insure water quality standards are met or will be attained within a reasonable timeline. Permits are reviewed and renewed on a 5-year cycle, as data and resources are available. Implementation Plans also include specific management strategies and timelines, with annual review and assessment by DEQ, for progress toward attaining water quality standards. In addition, Implementation Plans for nonpoint source activities will address costs and funding for improving water quality. All of these actions, taken together, will result in attainment of water quality standards.

Component 6: Timeline for Attainment of Water Quality Standards

Implementation Plans are plans that explain, as precisely as possible, how TMDL Wasteload and load allocations will be implemented by DMAs. Depending on the pollutant, it may take several years to several decades to meet load allocations and attain water quality standards. It is possible that after application of all reasonable best management practices and management strategies, some TMDL waste load allocations, load allocations or their associated surrogates cannot be achieved as originally established. However, DEQ does expect that water quality standards will be attained as soon as reasonably feasible given technical and economic constraints. As DEQ resources allow, annual evaluation and review of Implementation Plans, with adjustments made if necessary, will ensure timely progress in attaining water quality standards.

DEQ envisions the timelines for water quality standards attainment to consist of two time frames; a shorter term and a long-term time frame. The following figure shows how the timing for water quality standards attainment will work in the Umpqua Basin.

The figure below, gives the timeline for activities related to the WQMP and associated DMA Implementation Plans.

Activity	2007		2008		2009		2010	
DEQ Modification of General and Minor Permits								
Activity	2007		2008		2009		2010	
DMA Development and Submittal of Implementation and Monitoring Plans								
DMA Implementation of Plans								
DMA Submittal of Annual Reports								

Water Quality Management Plan Timeline
Estimates of time for meeting standards and full protection of beneficial uses were made based on existing plans, assumptions developed for the TMDLs, and estimates of system potential vegetation growth for reducing stream temperature. Temperature and channel morphology improvements are dependent on growth of site appropriate riparian vegetation and other land management actions. The longest-term treatment is restoration of riparian vegetation and growth where needed to provide system potential shade. However, system potential shade varies tremendously by stream size thus affecting restoration timing. For example, a system potential shade for a small stream may take 10 years versus 20 years for a larger stream. Two examples of milestone goals would be the ability to measure increases in instream shade by 2020 and to achieve instream temperatures that meet salmonid requirements by 2050. DEQ recognizes that restoration of streams will be an ongoing process.

Component 7: Identification of Responsible Participants

The purpose of this element is to identify the organizations responsible for the implementation of the plan and to list the major responsibilities of each organization. What follows is a simple list of those organizations and responsibilities. This is not intended to be an exhaustive list of every participant that bears some responsibility for improving water quality in the Umpqua Basin. Because this is a community wide effort, a complete listing would have to include every business, every industry, every farm, and ultimately every citizen living or working within the basin. Citizens are all contributors to the existing quality of the waters in the Umpqua Basin and must be participants in the efforts to improve water quality. Table 7.6 shows Umpqua Basin 303(d) listed stream segments along with the responsible Designated Management Agencies.

Oregon Department of Environmental Quality

NPDES Permitting and Enforcement
WPCF Permitting and Enforcement
Technical Assistance
Financial Assistance

Oregon Department of Agriculture

Agricultural Water Quality Management Plan Development, Implementation & Enforcement.
CAFO Permitting and Enforcement
Technical Assistance
Revise Agricultural WQMAP
Rules under Senate Bill (SB)1010 to clearly address TMDL and Load Allocations as necessary.
Riparian area management

Oregon Department of Forestry

Forest Practices Act (FPA Implementation)
Conservation Reserved Enhancement Program
Revise statewide FPA rules and/or adopt Watersheds specific rules as necessary.
Riparian area management

Oregon Department of Transportation

Routine Road Maintenance, Water Quality and Habitat Guide Best Management Practices
Pollution Control Plan and Erosion Control Plan
Design and Construction

Federal Land Management Agencies (Forest Service and BLM)

Implementation of Northwest Forest Plan
Implementation of Umpqua Basin Water Quality Restoration Plan

Douglas County

Construction, operation and maintenance of County roads and county storm sewer system.
Land use planning/permitting
Maintenance, construction and operation of parks and other county owned facilities and infrastructure, including Galesville, Cooper Creek and Ben Irving Reservoirs
Inspection and permitting of septic systems
Riparian area management

Incorporated Cities

Construction, operation and maintenance of city roads and county storm sewer system
Storm water planning, as appropriate
Land use planning/permitting
Maintenance, construction and operation of parks and other city-owned facilities and infrastructure
Riparian area management

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
North Umpqua Subbasin			
Unnamed Waterbody (Tributary to Rock Creek)	Mouth to Headwaters RM 0 – 2.8	Temperature – Spawning 9/1 – 5/31	ODA, ODF, USDI- BLM, Douglas County
Big Bend Creek	Mouth to Headwaters RM 0 – 10.6	Temperature – Core Cold Water	USDA - Umpqua National Forest
Boulder Creek	Mouth to Headwaters RM 0 – 8.7	Temperature – Spawning	USDA - Umpqua National Forest
Calf Creek	Mouth to Headwaters RM 0 – 8.0	Temperature – Core Cold Water and Spawning	USDA - Umpqua National Forest
Canton Creek	Mouth to Pass Creek RM 0 – 10.0	Temperature – Core Cold Water and Spawning, Sedimentation	ODA, ODF, USDA – Umpqua National Forest, USDI – BLM, Douglas County
Canton Creek	Pass Creek to ?? RM 10 – 16.5	Temperature – Core Cold Water	USDA – Umpqua National Forest, USDI - BLM
Cedar Creek	Mouth to Headwaters RM 0 – 1.9	Temperature – Core Cold Water	USDA - Umpqua National Forest
City Creek	Mouth to Headwaters RM 0 – 6.6	Temperature – Core Cold Water	ODA, ODF, USDA - Umpqua National Forest, Douglas County
Clover Creek	Mouth to Headwaters RM 0 – 4.2	Temperature – Core Cold Water	ODA, ODF, Douglas County
Copeland Creek	Mouth to Headwaters RM 0 – 11.6	Temperature – Core Cold Water and Spawning	USDA - Umpqua National Forest
Diamond Lake	Lake RM 0 – 3.7	Aquatic Weeds/Algae, Dissolved Oxygen (Year Round), pH – Summer, pH – Fall, Winter, Spring	USDA - Umpqua National Forest

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
East Fork Copeland Creek	**Mouth to Headwaters RM 0 – 3**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
East Fork Rock Creek	**Mouth to Headwaters RM 0 – 6.0**	**Temperature – Core Cold Water and Spawning**	**ODA, ODF, USDI- BLM, Douglas County**
East Fork Steamboat Creek	**Mouth to Headwaters RM 0 – 3**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
East Pass Creek	**Mouth to Headwaters RM 0 - 3**	**Temperature – Spawning**	**ODA, ODF, USDI- BLM, Douglas County**
Eggleston Creek	**Mouth to Headwaters RM 0 – 2.7**	**Temperature – Spawning 1/1 – 6/15**	**ODA, ODF, USDA – Umpqua National Forest, USDI – BLM, Douglas County**
Fish Creek	**Mouth to PPL Diversion RM 0 – 6.9**	**Dissolved Oxygen (DO) – Cold Water – Summer**	**USDA - Umpqua National Forest; PacifiCorp**
Fish Creek	**Mouth to Headwaters RM 0 – 18.6**	**Temperature – Rearing**	**USDA - Umpqua National Forest; PacifiCorp**
Harrington Creek	**Mouth to Headwaters RM 0 – 3.8**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Honey Creek	**Mouth to Headwaters RM 0 – 3.2**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Horse Heaven Creek	**Mouth to Headwaters RM 0 – 6.3**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin

Stream	Segment	Listings	DMAs
Lake Creek	Lemolo Lake to Diamond Lake RM 0 – 11.5	pH – Summer, Temperature – Rearing	USDA - Umpqua National Forest
Little Rock Creek	Mouth to Headwaters RM 0 – 6.6	Temperature – Core Cold Water	ODA, ODF, USDI- BLM, Douglas County
North Fork East Fork Rock Creek	Mouth to Headwaters RM 0 – 4.2	Temperature – Core Cold Water	ODA, ODF, USDI – BLM, Douglas County
North Umpqua River	Near confluence with Clearwater River RM 77 - 78	pH – Summer	USDA – Umpqua National Forest, PacifiCorp
North Umpqua River	Mouth to upstream of Boulder Creek RM 0 – 68.9	Temperature – Core Cold Water	ODA, ODF, USDA – Umpqua National Forest, USDI – BLM, Douglas County
Northeast Rock Creek	Mouth to Headwaters RM 0 – 6.1	Temperature – Core Cold Water	ODA, ODF, USDI – BLM, Douglas County
Panther Creek	Mouth to Junction Creek, RM 0 – 1.7	Temperature – Core Cold Water and Spawning	USDA - Umpqua National Forest
Rock Creek	Mouth to Stony Creek RM 0 – 10.2	Temperature – Core Cold Water	ODA, ODF, USDI- BLM, Douglas County
Rock Creek	Mouth to Headwaters RM 0 - 19.1	Temperature - Spawning	ODA, ODF, USDI- BLM, Douglas County

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Scaredman Creek	**Mouth to Headwaters RM 0 – 2.1**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Steamboat Creek	**Mouth to Deep Creek RM 0 – 6.1**	**Dissolved Oxygen (DO) – Cold Water – Summer**	**USDA - Umpqua National Forest**
Steamboat Creek	**Mouth to Big Bend Creek RM 0 – 10.9**	**Temperature – Spawning 9/1 – 6/15**	**USDA – Umpqua National Forest**
Steamboat Creek	**Mouth to Headwaters RM 0 – 23.4**	**pH – Summer; Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
Steelhead Creek	**Mouth to Headwaters RM 0 – 4.8**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
Susan Creek	**Mouth to Headwaters RM 0 – 4.3**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Watson Creek	**Mouth to Headwaters RM 0 – 7.7**	**Temperature – Spawning**	**USDA - Umpqua National Forest**
South Umpqua Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Unnamed Waterbody – Trib of West Fork Canyon Creek	**Mouth to Headwaters RM 0 – 2.9**	**Temperature – Rearing and Spawning – 9/15 – 5/31**	**ODA, ODF, USDI- BLM, Douglas County**
Applegate Creek	**Mouth to Headwaters RM 0 – 4.8**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Bear Creek	**Mouth to Headwaters RM 0 – 4.7**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Beaver Creek	**Mouth to Beaver Lake RM 0 – 2.1**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**
Black Canyon Creek	**Mouth to Headwaters RM 0 – 5.2**	**pH - Summer**	**USDA - Umpqua National Forest**
Black Rock Fork	**Mouth to Unnamed Trib RM 0 – 6.4**	**Temperature – Spawning - 9/1 - 615**	**USDA - Umpqua National Forest**
Black Rock Fork	**Mouth to Headwaters RM 0 – 9.7**	**Temperature - Core Cold Water**	**USDA – Umpqua National Forest**
Boulder Creek	**Mouth to Headwaters RM 0 – 10.7**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
Brownie Creek	**Mouth to Headwaters RM 0 – 5.8**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**
Buck Fork	**Mouth to Headwaters RM 0 – 4.4**	**Temperature - Rearing**	**ODA, ODF, USDI – BLM, Douglas County**
Buckeye Creek	**Mouth to Coyote Creek RM 0 – 9.8**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
Callahan Creek (Elk Creek drainage)	**Mouth to Headwaters RM 0 – 6.2**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Canyon Creek	**Mouth to Packard Creek RM 0 – 6.2**	**Temperature – Spawning – 10/15 – 5/15**	**ODA, ODF, USDI- BLM, Douglas County, City of Canyonville**
Canyon Creek	**Mouth to Headwaters RM 0 – 9.9**	**Temperature - Rearing**	**ODA, ODF, USDI – BLM, Douglas County**
Castle Rock Fork	**Mouth to Headwaters RM 0 – 11.9**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
Cattle Creek	**Mouth to Headwaters RM 0 – 3.2**	**Temperature – Rearing and Spawning - 10/15 – 5/15**	**ODA, ODF, USDI- BLM, Douglas County**
Coffee Creek	**Mouth to Headwaters RM 0 – 9.4**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Coffee Creek	**Mouth to Ruby Creek RM 0 – 2.5**	**Temperature – Spawning – 1/1 – 6/15**	**ODA, ODF, USDI – BLM, Douglas County**
Cow Creek	**Mouth to West Fork Cow Creek RM 0 – 26.3**	**pH – Summer**	**ODA, ODF, USDI- BLM, Douglas County**
Cow Creek	**Mouth to Susan Creek RM 0 – 29.3**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Dads Creek	**Mouth to Headwaters RM 0 – 3.4**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Days Creek	**Mouth to Headwaters RM 0 – 13.8**	**Temperature – Spawning**	**ODA, ODF, USDI- BLM, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Deadman Creek	**Mouth to Headwaters RM 0 – 9.0**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest , USDI- BLM, Douglas County**
Deer Creek	**Mouth to Headwaters RM 0 – 9.6**	**Bacteria – Year round, Dissolved Oxygen – Year-round, Temperature, Rearing and Spawning – 9/15 – 5/31**	**ODA, ODF, City of Roseburg, Douglas County**
Dismal Creek	**Mouth to Headwaters RM 0 – 2.7**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**
Doe Creek	**Mouth to Headwaters RM 0 – 4.8**	**Temperature - Rearing**	**ODA, ODF, USDI – BLM, Douglas County**
Drew Creek	**Mouth to Headwaters RM 0 – 8.3**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**
Dumont Creek	**Mouth to Straight Creek RM 0 – 2.9**	**Biological Criteria**	**USDA - Umpqua National Forest**
Dumont Creek	**Straight Creek to Headwaters RM 2.9 – 9.5**	**Temperature – Spawning – 1/1 – 6/15**	**USDA - Umpqua National Forest**
Dumont Creek	**Mouth to Headwaters RM 0 – 9.5**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
East Fork Deadman Creek	**Mouth to Headwaters RM 0 – 5.8**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
East Fork Stouts Creek	**Mouth to Headwaters RM 0 – 4.9**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Elk Creek	**Mouth to Headwaters RM 0 – 14.6**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**
Elk Valley Creek	**RM 1.9 to Headwaters RM 1.9 – 6.0**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Fate Creek	**Mouth to Headwaters RM 0 – 2.5**	**Temperature – Rearing**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**
Flat Creek	**Mouth to Headwaters RM 0 – 5.0**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Fortune Branch	**Mouth to Headwaters RM 0 – 4.7**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Francis Creek	**Mouth to Headwaters RM 0 – 3.7**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**
Jackson Creek	**Soup Creek to Lonewoman Creek RM 14.7 – 21.5**	**Temperature – Spawning – 9/1- 6/15**	**USDA - Umpqua National Forest**
Jackson Creek	**Mouth to Headwaters RM 0 – 25.0**	**pH – Summer, Biological Criteria, Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**
Joe Hall Creek	**Mouth to Headwaters RM 0 – 3.4**	**Temperature – Core Cold Water**	**ODA, ODF, USDA - Umpqua National Forest, Douglas County**
Johnson Creek	**Mouth to Headwaters RM 0 – 1.2**	**Temperature - Rearing**	**USDI- BLM**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Lavadoure Creek	**Mouth to Headwaters RM 0 – 2.2**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Letitia Creek	**Mouth to Headwaters RM 0 – 3.4**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Lookingglass Creek	**Mouth to Headwaters RM 0 – 11.1**	**Temperature - Rearing**	**ODA, ODF, Douglas County**
Louis Creek	**Mouth to Headwaters RM 0 – 9.2**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Middle Creek	**Mouth to Unnamed Trib RM 0 – 10.1**	**Temperature – Spawning – 10/15 – 5/15**	**ODA, ODF, USDI- BLM, Douglas County**
Middle Creek	**Mouth to Headwaters RM 0 – 12.8**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Middle Fork Deadman Creek	**Mouth to Headwaters RM 0 – 4.6**	**Temperature – Core Cold Water and Spawning- 9/15 – 5/31**	**USDI- BLM**
Mitchell Creek	**Mouth to Headwaters RM 0 – 4.2**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
North Fork Deer Creek	**Mouth to Headwaters RM 0 – 6.7**	**Bacteria – All year**	**ODA, ODF, USDI- BLM, Douglas County**
North Myrtle Creek	**Mouth to Buck Fork RM 0 – 15.0**	**Bacteria, Summer and Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Olalla Creek	**Mouth to Headwaters RM 0 – 21.8**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Olalla Creek	**Mouth to Thompson Creek RM 0 – 15.6**	**Biological Criteria**	**ODA, ODF, USDI- BLM, Douglas County**
Quartz Creek	**Mouth to Headwaters RM 0 – 8.4**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
Quines Creek	**Mouth to Headwaters RM 0 – 6.0**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Rice Creek	**Mouth to Headwaters RM 0 – 6. 8**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Riffle Creek	**Mouth to Headwaters RM 0 – 5.7**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Riser Creek	**Mouth to Headwaters RM 0 – 4.1**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
School Hollow	**Mouth to Headwaters RM 0 – 1.6**	**Temperature - Rearing**	**ODA, ODF, Douglas County**
Shively Creek	**Mouth to Headwaters RM 0 – 5.2**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Skull Creek	**Mouth to Headwaters RM 0 – 2.0**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Slick Creek	**Mouth to Headwaters RM 0 – 4.9**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
Slide Creek	**Mouth to Headwaters RM 0 – 4.4**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Snow Creek	**Mouth to Headwaters RM 0 – 5.3**	**Temperature – Core Cold Water**	**USDA - Umpqua National Forest**
South Fork Middle Creek	**Mouth to Headwaters RM 0 – 4.4**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
South Myrtle Creek	**Mouth to Headwaters RM 0 – 22.2**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
South Umpqua River	**Mouth to Roberts Creek RM 0 – 15.9**	**Aquatic Weeds/Algae, Biological Criteria, , pH –6/1 – 9/30, Nutrients – Phosphorus**	**ODA, ODF, Douglas County, NPDES Permittees discharging to South Umpqua River**
South Umpqua River	**Mouth to RM 5.0 RM 0 – 5.0**	**pH – Winter, spring, fall**	**ODA, ODF, Douglas County, NPDES Permittees discharging to South Umpqua River**
South Umpqua River	**Roberts Creek to Days Creek RM 15.9 – 57.7**	**Aquatic Weeds/Algae, Biological Criteria, Chlorophyll a – Summer, Bacteria – Summer, pH – Summer**	**ODA, ODF, USDI- BLM, Douglas County, NPDES Permittees discharging to South Umpqua River**
South Umpqua River	**Days Creek to Castle Rock/Black Rock Forks RM 57.7 – 102.2**	**pH – Summer**	**ODA, ODF, USDA – Umpqua National Forest, USDI – BLM, Douglas County, NPDES Permittees discharging to South Umpqua River**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin

Stream	Segment	Listings	DMAs
South Umpqua River	Mouth to Corn Creek RM 0 – 68.8	Dissolved Oxygen, Non-Spawning; Temperature - Rearing	ODA, ODF, USDA – Umpqua National Forest, USDI – BLM, Douglas County, NPDES Permittees discharging to South Umpqua River
South Umpqua River	Corn Creek to Castle Rock/Black Rock Forks RM 68.8 – 102.1	Temperature – Core Cold Water	ODA, ODF, USDA – Umpqua National Forest, USDI – BLM, Douglas County, NPDES Permittees discharging to South Umpqua River
Stouts Creek	Mouth to Headwaters RM 0 – 7.9	Temperature – Rearing	ODA, ODF, USDI- BLM, Douglas County
Thompson Creek	Mouth to Headwaters RM 0 – 7.6	Temperature – Rearing	ODA, ODF, USDI- BLM, Douglas County
Union Creek	Mouth to Headwaters RM 0 – 7.0	Temperature – Rearing	ODA, ODF, USDI- BLM, Douglas County
Weaver Creek	Mouth to Headwaters RM 0 – 5.8	Temperature – Rearing	ODA, ODF, USDI- BLM, Douglas County
West Fork Canyon Creek	Mouth to Headwaters RM 0 – 8.8	Temperature – Rearing	ODA, ODF, USDI- BLM, Douglas County
West Fork Canyon Creek	Mouth to Unnamed Trib RM 0 – 2.4	Temperature – Spawning – 10/15 – 5/15	ODA, ODF, USDI- BLM, Douglas County

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
West Fork Cow Creek	**Mouth to East Fork West Fork Cow RM 0 – 17.9**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Windy Creek	**Mouth to Headwaters RM 0 – 9..4**	**Temperature – Core Cold Water**	**DSL, ODA, ODF, Douglas County**
Wood Creek	**Mouth to Headwaters RM 0 – 4.0**	**Temperature – Rearing and Spawning – 10/15 – 5/15**	**ODA, ODF, Douglas County**
Woodford Creek	**Mouth to Headwaters RM 0 – 3.5**	**Temperature – Core Cold Water**	**ODA, ODF, USDI- BLM, Douglas County**
Mainstem Umpqua Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Brush Creek	**Mouth to RM 6.5 above Blue Hole Creek RM 0 – 6.5**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Buck Creek	**Mouth to West Fork RM 0 – 0.7**	**Temperature – Rearing**	**ODA, ODF, Douglas County**
Bum Creek	**Mouth to Headwaters RM 0 – 2.3**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Calapooya Creek	**Mouth to Oldham Creek RM 0 – 18.7**	**pH – Summer, Bacteria, Year round, Dissolved Oxygen (DO) – Spawning 9/15 – 12/31, Temperature – Rearing**	**ODA, ODF, Douglas County**
Cedar Creek	**Mouth to Headwaters RM 0 – 3.0**	**Temperature – Rearing and Spawning**	**ODA, ODF, USDA – Siuslaw National Forest, USDI – BLM, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
Cleghorn Creek	**Mouth to Headwaters RM 0 – 2.8**	**Temperature – Rearing and Spawning**	**ODA, ODF, USDI- BLM, Douglas County**
Elk Creek	**Mouth to Yoncalla Creek RM 0 – 25.9**	**Bacteria – Year round, Dissolved Oxygen (DO) – Spawning 6/1 – 9/14 Dissolved Oxygen (DO) – Spawning 9/15 – 12/31, Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Elk Creek	**Yoncalla Creek to RM 25.9 – 45.5**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Halfway Creek	**Mouth to RM 0 – 6.3**	**Temperature - Spawning**	**ODA, ODF, USDI- BLM, Douglas County**
Herb Creek	**Mouth to Headwaters RM 0 – 2.7**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Little Wolf Creek	**Mouth to Headwaters RM 0 – 5.4**	**Temperature- Rearing and Spawning**	**ODA, ODF, USDI- BLM, Douglas County**
Middle Fork North Fork Smith River	**Mouth to Headwaters RM 0 – 4.6**	**Temperature – Rearing**	**ODA, ODF, USDA=Siuslaw National Forest, USDI-BLM, Douglas County**
Miner Creek	**Mouth to Headwaters RM 0 – 4.2**	**Temperature- Rearing and Spawning**	**ODA, ODF, USDI- BLM, Douglas County**
North Fork Smith River	**Mouth to Headwaters RM 0 – 31.8**	**Temperature - Rearing**	**ODA, ODF, USDA-Siuslaw National Forest, Douglas County**
North Fork Smith River	**Middle Fork to Headwaters RM 19.1 – 31.8**	**Biological Criteria**	**ODA, ODF, USDA-Siuslaw National Forest, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin			
Stream	**Segment**	**Listings**	**DMAs**
North Fork Tom Folley Creek	**Mouth to Unnamed Tributary RM 0 – 2.0**	**Temperature- Rearing and Spawning**	**ODA, ODF, USDI- BLM, Douglas County**
Rader Creek	**Mouth to Headwaters RM 0 – 4.7**	**Temperature- Rearing and Spawning**	**ODA, ODF, USDI- BLM, Douglas County**
Russell Creek	**Mouth to Headwaters RM 0 – 2.2**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Scholfield Creek	**Tidal Portion of the Slough RM 0 – 5.0**	**Bacteria – All year - shellfish**	**ODA, ODF City of Reedsport, Douglas County**
Smith River	**North Fork to Headwaters RM 15.7 – 83.7**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Soup Creek	**Mouth to North Fork RM 0 – 1.4**	**Temperature- Rearing**	**ODA, ODF, Douglas County**
South Fork Smith River	**Mouth to Headwaters RM 0 – 7.0**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
South Sister Creek	**Mouth to Headwaters RM 0 – 8.6**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Tom Folley Creek	**Mouth to Headwaters RM 0 – 8.2**	**Temperature- Rearing and Spawning**	**DSL, ODA, ODF, USDI- BLM, Douglas County**
Umpqua River	**Smith River to Little Mill Creek (Scottsburg) RM 11.8 – 25.9**	**Temperature- Rearing**	**DSL, ODA, ODF, USDA – Siuslaw National Forest, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin

Stream	Segment	Listings	DMAs
Umpqua River	**Little Mill Creek (Scottsburg) to North/South Fork** **RM 25.9 – 109.3**	**Temperature- Rearing, Bacteria – Fall, Winter, Spring**	**ODA, ODF, USDI- BLM, Douglas County**
Umpqua River	**Bay; Marker 6a to Big Bend RM 1 – 6.7**	**Bacteria – All Year – shellfish**	**DSL, ODA, ODF, USDA – Siuslaw National Forest, Douglas County**
Umpqua River	**Bay; Marker No. 19 to 1 mile upstream of Reedsport** **RM 7.7 - 11.8**	**Bacteria – All year - shellfish**	**ODA, ODF, City of Reedsport, Douglas County**
Unnamed Waterbody (Tributary to Little South Fork Smith River)	**Mouth to Headwaters** **RM 0 – 1.4**	**Temperature - Spawning**	**USDI - BLM**
Unnamed Waterbody (Tributary to Middle Fork North Fork Smith River)	**Mouth to Headwaters** **RM 0 – 1.6**	**Temperature - Rearing**	**USDA – Siuslaw National Forest**
Unnamed Waterbody (Tributary to Middle Fork North Fork Smith River)	**Mouth to just below unnamed tributary** **RM 0 – 1.0**	**Temperature - Rearing**	**USDA – Siuslaw National Forest**
West Branch North Fork Smith River	**Mouth to Headwaters** **RM 0 – 3.4**	**Temperature - Rearing**	**ODA, ODF, Douglas County**
West Fork Smith River	**Mouth to Headwaters** **RM 0 – 15.9**	**Temperature - Rearing**	**ODA, ODF, USDI- BLM, Douglas County**

Table 7.7 Umpqua Basin Designated Management Agencies, By Subbasin

Stream	Segment	Listings	DMAs
Wolf Creek	**Mouth to just below Rader Creek** **RM 0 - 4**	**Temperature – Rearing**	**ODA, ODF, USDI- BLM, Douglas County**
Wolf Creek	**Just below Rader Creek to Headwaters** **RM 4 – 7.5**	**Temperature - Spawning**	**ODA, ODF, USDI- BLM, Douglas County**
Yellow Creek	**Mouth to Headwaters** **RM 0 – 9.1**	**Temperature- Rearing and Spawning**	**ODA, ODF, USDI- BLM, Douglas County**

Component 8: Identification of Available Implementation Plans

For the Agricultural Water Quality Management Area Plan, the Oregon Department of Agriculture is the responsible entity, and has provided in its administrative rules how the plan will be implemented. Appendix A contains the plan.

For the Forest Practices Act, the Department of Forestry is the responsible entity, and has provided in its administrative rules and in Appendix B how the plan will be implemented.

The following Implementation Plans are currently available:

Water Quality Restoration Plans: The following WQRPs have been received by DEQ. The first four are available on the Internet at http://www.or.blm.gov/roseburg/Info/WQ.htm. (temporarily unavailable).

Lower Cow Creek Watershed Analysis and Water Quality Restoration Plan
Myrtle Creek Watershed Analysis and Water Quality Restoration Plan
Olalla Creek/Lookingglass Creek Watershed Analysis and Water Quality Restoration Plan
South Umpqua Watershed Analysis and Water Quality Restoration Plan
Upper Smith River Water Quality Restoration Plan
Lower Smith River Water Quality Restoration Plan
North Fork Smith River Water Quality Restoration Plan
Umpqua National Forest Restoration Business Plan (2000) and 2003 Update
Siuslaw National Forest Restoration Business Plan

Component 9: Schedule for preparation and submission of Implementation Plans

Douglas County: Douglas County is responsible for preparation and submission of a TMDL Implementation Plans within 1-1/2 years of the time the Final TMDL is issued:

The following cities are responsible for preparation and submission of TMDL Implementation Plans within 1-1/2 years of the time the Final TMDL is issued:

City of Canyonville
City of Drain
City of Elkton
City of Myrtle Creek
City of Oakland
City of Reedsport
City of Riddle
City of Roseburg
City of Sutherlin
City of Oakland
City of Winston
City of Yoncalla

Component 10: Reasonable Assurance

This section of the WQMP is intended to provide reasonable assurance that the WQMP (along with the associated DMA-specific Implementation Plans) will be implemented and that the TMDL and associated allocations will be met.

There are several programs that are either already in place or will be put in place to help assure that this WQMP will be implemented. Some of these are traditional regulatory programs such as specific requirements under NPDES discharge permits. Other programs address non-point sources under the auspices of state law (for forested and agricultural lands) and voluntary efforts.

A. Point Sources: NPDES and WPCF Permit Programs

The DEQ administers two different types of wastewater permits in implementing Oregon Revised Statute (ORS) 468B.050. These are: the National Pollutant Discharge Elimination System (NPDES) permits for surface water discharge; and Water Pollution Control Facilities (WPCF) permits for onsite (land) disposal. The NPDES permit is also a federal permit, which is required under the Clean Water Act for discharge of waste into waters of the United States. DEQ has been delegated authority to issue NPDES permits by EPA.

The WPCF permit is unique to the State of Oregon. As the permits are renewed, they will be reviewed to insure that all 303(d) related issues are addressed in the permit. These permit activities assure that elements of the TMDL and WQMP involving urban and industrial pollution problems will be implemented.

For point sources, provisions to address the appropriate waste load allocations (WLAs) will be incorporated into NPDES permits when permits are renewed by DEQ, typically within 1 year after EPA approves the TMDL. It is likely each point source will be given a reasonable time to upgrade, if necessary, to meet its new permit limits. A schedule for meeting the requirements will be incorporated into the permit. Adherence to permit conditions is required by State and Federal Law and DEQ has the responsibility to ensure compliance.

B. Nonpoint Sources

Land Use: **All agricultural operations**
Plan Title: **Umpqua Basin Agricultural Water Quality Management Area Plan, January, 2001**
DMA: **Oregon Department of Agriculture**
Status: **Completed. Currently under review as part of a 2-year revision cycle. (See Appendix A for a summary of the plan)**

It is the Oregon Department of Agriculture's (ODA) statutory responsibility to develop agricultural water quality management (AWQM) plans and enforce rules that address water quality issues on agricultural lands. The AWQM Act directs ODA to work with local farmers and ranchers to develop water quality management area plans for specific watersheds that have been identified as violating water quality standards and having agriculture water pollution contributions. The agriculture water quality management area plans are expected to identify problems in the watershed that need to be addressed and outline ways to correct those problems. These water quality management plans are developed at a local level, reviewed by the State Board of Agriculture, and then adopted into the Oregon Administrative Rules. It is the intent that these plans focus on education, technical assistance, and flexibility in addressing agriculture water quality issues. These plans and rules will be developed or modified to achieve water quality standards and will address the load allocations identified in the TMDL. In those cases when an operator refuses to take action, the law allows ODA to take enforcement action. DEQ will work with ODA to ensure that rules and plans meet load allocations.

Recognizing the adopted rules need to be quantitatively evaluated in terms of load allocations in the TMDL and pursuant to the June 1998 Memorandum of Agreement between ODA and DEQ, the agencies will conduct a technical evaluation. The agencies will establish the relationship between the plan and its implementing rules and the load allocations in the TMDL to determine if the rules provide reasonable assurance that the TMDLs will be achieved. The AWQMA Local Advisory Committee (LAC) will be apprised and consulted during this evaluation. This adaptive management process provides for review of the AWQMA plan to determine if any changes are needed to the current AWQMA rules specific to the Umpqua Basin.

Appendix A includes the Agricultural Water Quality Management plan for the Umpqua Basin.

Land Use: All private commercial timber operations
Plan Title: Oregon Forest Practices Act
DMA: Oregon Department of Forestry (ODF)
Status: Completed (Sufficiency Analysis occurring according to schedule shown in Appendix A) See Appendix A for in-depth description of the FPA

The Oregon Department of Forestry (ODF) is the designated management agency for regulation of water quality on non-federal forest lands. The Oregon Board of Forestry (BOF), in consultation with the Environmental Quality Commission (EQC), establish best management practices (BMPs) and other rules to ensure that, to the maximum extent practicable, non-point source pollution resulting from forest operations does not impair the attainment of water quality standards. The Board of Forestry has adopted water protection rules, including but not limited to OAR Chapter 629, Divisions 635-660, which describe BMPs for forest operations. These rules are implemented and enforced by ODF and monitored to assure their effectiveness.

By statute, forest operators conducting operations in accordance with the BMPs are considered to be in compliance with Oregon's water quality standards. ODF provides on the ground field administration of the Forest Practices Act (FPA). For each administrative rule, guidance is provided to field administrators to insure proper, uniform and consistent application of the Statutes and Rules. The FPA requires penalties, both civil and criminal, for violation of Statutes and Rules. Additionally, whenever a violation occurs, the responsible party is obligated to repair the damage. For more information, refer to the Management Measures element of this Plan.

ODF and DEQ are involved in several statewide efforts to analyze the existing FPA measures and to better define the relationship between the TMDL load allocations and the FPA measures designed to protect water quality. How water quality parameters are affected, as established through the TMDL process, as well as other monitoring data, will be an important part of the body of information used in determining the adequacy of the FPA.

As the DMA for water quality management on nonfederal forestlands, the ODF has recently completed working with the ODEQ through a memorandum of understanding (MOU) signed in April of 1998. This MOU was designed to improve the coordination between the ODF and the ODEQ in evaluating and proposing possible changes to the forest practice rules as part of the Total Maximum Daily Load process. The purpose of the MOU was also to guide coordination between the ODF and ODEQ regarding water quality limited streams on the 303(d) list. An evaluation of rule adequacy has been conducted (also referred to as the "Sufficiency Analysis") through the analysis of water quality parameters that can potentially be affected by forest practices. This statewide demonstration of forest practices rule effectiveness in the protection of water quality addressed the following specific parameters:

- Temperature
- Sediment
- Turbidity
- Aquatic habitat modification
- Bio-criteria

The Sufficiency Analysis final report has been externally reviewed by peers and other interested parties. The report was designed, in part, to provide background information and assessments of BMP effectiveness in meeting water quality standards. The report demonstrates overall FPA adequacy at the statewide scale with due consideration to regional and local variation in effects. Achieving the goals and objectives of the FPA will ensure the achievement and maintenance of water quality goals. The report offers recommendations to highlight general areas where current practices could be improved in order to better meet the FPA goals and objectives and in turn provide added assurance of meeting water quality standards. The Board of Forestry will consider these recommendations, along with the FPAC recommendations, in their on-going review of the FPA in order to determine whether revisions and/or additional voluntary approaches are necessary consistent with ORS 527.710 and ORS 527.714.

ODF and DEQ statutes and rules include provisions for adaptive management that provide for revisions to FPA practices where necessary to meet water quality standards. These provisions are described in ORS 527.710, ORS 527.765, ORS 183.310, OAR 340-041-0026, OAR 629-635-110, and OAR 340-041-0120. For a more detailed description of current adaptive management efforts and the roles of the BOF and EQC in developing BMPs that will achieve water quality standards see Appendix B (detailed description of the non-federal forest lands portion of the Water Quality Management Plan).

Land Use:	**Roads, highways and bridges under the jurisdiction of ODOT**
Plan Title:	**Routine Road Maintenance. Water Quality and Habitat Guide Best Management Practices, July 1999**
DMA:	**Oregon Department of Transportation**
Status:	**Completed (See Appendix C for summary of the plan. Entire plan can be viewed online on the ODOT website at: http://www.odot.state.or.us/eshtm/images/4dman.pdf**

The Oregon Department of Transportation (ODOT) has been issued an NPDES MS4 waste discharge permit. Included with ODOT's application for the permit was a surface water management plan which has been approved by DEQ and which addresses the requirements of a Total Maximum Daily Load (TMDL) allocation for pollutants associated with the ODOT system. Both ODOT and DEQ agree that the provisions of the permit and the surface water management plan will apply to ODOT's statewide system. This statewide approach for an ODOT TMDL watershed management plan addresses specific pollutants, but not specific watersheds. Instead, this plan demonstrates how ODOT will incorporate water quality protection into project development, construction, and operations and maintenance of the state and federal transportation system that is managed by ODOT, thereby meeting the elements of the National Pollutant Discharge Elimination System (NPDES) program, and the TMDL requirements.
The MS4 permit and the plan:

- Streamline the evaluation and approval process for the watershed management plans
- Provide consistency to the ODOT highway management practices in all TMDL watersheds.
- Eliminate duplicative paperwork and staff time developing and participating in the numerous TMDL management plans.

Temperature and sediment are the primary concerns for pollutants associated with ODOT systems that impair the waters of the state. DEQ is still in the process of developing the TMDL water bodies and determining pollutant levels that limit their beneficial uses. As TMDL allocations are established by watershed, rather than by pollutants, ODOT is aware that individual watersheds may have pollutants that may require additional consideration as part of the ODOT watershed management plan. When these circumstances arise, ODOT will work with DEQ to incorporate these concerns into the statewide plan

Land Use: **All land uses on Federal Lands**
Plan Title: **Umpqua Basin Water Quality Restoration Plan**
DMA: **USFS and BLM**
Status: **Currently under development**

Federal Forest Lands
All management activities on federal lands managed by the U.S. Forest Service (USFS) and the Bureau of Land Management must follow standards and guidelines (S&Gs) as listed in the respective Land Use and Management Plans (LRMPs), as amended, for the specific land management units.

C. Northwest Forest Plan

In response to environmental concerns and litigation related to timber harvest and other operations on Federal Lands, the United States Forest Service (USFS) and the Bureau of Land Management (BLM) commissioned the Forest Ecosystem Management Assessment Team (FEMAT) to formulate and assess the consequences of management options. The assessment emphasizes producing management alternatives that comply with existing laws and maintain the highest contribution of economic and social well being. The "backbone" of ecosystem management is recognized as constructing a network of late-successional forests and an interim and long-term scheme that protects aquatic and associated riparian habitats adequate to provide for *threatened species* and *at risk species*. Biological objectives of the Northwest Forest Plan include assuring adequate habitat on Federal lands to aid the "recovery" of late-successional forest habitat-associated species listed as threatened under the Endangered Species Act and preventing species from being listed under the Endangered Species Act.

In the Umpqua Basin, Water Quality Restoration Plans (WQRPs) are typically developed at the watershed scale. Taken together, the individual WQRPs will constitute the Umpqua Basin WQRP. A list of the WQRPs which have been developed for lands in the Umpqua Basin is included in WQMP Component 8: Available Implementation Plans.

D. Urban and Rural Sources

Responsible participants for implementing DMA-specific water quality management plans for urban and rural sources were identified earlier in this Water Quality Management Plan. Upon approval of the Umpqua Basin TMDLs, it is DEQ's expectation that identified, responsible participants will develop, submit to DEQ, and implement individual Implementation Plans that will achieve the load allocations established by the TMDLs. These activities will be accomplished by the responsible participants in accordance with the Schedule in this Water Quality Management Plan. The DMA-specific Implementation Plans must address the following items, as specified in OAR 340-042-0809(3) (a):
(A) Identify the management strategies the DMA or other responsible person will use to achieve load allocations and reduce pollutant loading;
(B) Provide a timeline for implementing management strategies and a schedule for completing measurable milestones;
(C) Provide for performance monitoring with a plan for periodic review and revision of the implementation plan;
(D) To the extent required by ORS 197.180 and OAR chapter 340, division 18, provide evidence of compliance with applicable statewide land use requirements; and
(E) Provide any other analyses or information specified in the WQMP.

Should any responsible participant fail to comply with their obligations under this WQMP, the Department will take all necessary action to seek compliance. Such action will first include negotiation, but could evolve to issuance of Department or Commission Orders and other enforcement mechanisms.

E. The Oregon Plan

The Oregon Plan for Salmon and Watersheds represents a major effort, unique to Oregon, to improve watersheds and restore endangered fish species. The Oregon Plan is a major component of the demonstration of "reasonable assurance "that this TMDL WQMP will be implemented.

The Oregon Plan consists of four essential elements:

- Coordinated Agency Programs
- Community-Based Action
- Monitoring
- Appropriate Corrective Measures

Coordinated Agency Programs

Many state and federal agencies administer laws, policies, and management programs that have an impact on salmon and water quality. These agencies are responsible for fishery harvest management, production of hatchery fish, water quality, water quantity, and a wide variety of habitat protection, alteration, and restoration activities. Previously, agencies conducted business independently. Water quality and salmon suffered because they were affected by the actions of all the agencies, but no single agency was responsible for comprehensive, life-cycle management. Under the Oregon Plan, all government agencies that impact salmon are accountable for coordinated programs in a manner that is consistent with conservation and restoration efforts.

Community-Based Action

Government, alone, cannot conserve and restore salmon across the landscape. The Oregon Plan recognizes that actions to conserve and restore salmon must be worked out by communities and landowners, with local knowledge of problems and ownership in solutions. Watershed councils, soil and water conservation districts, and other grassroots efforts are vehicles for getting the work done. Government programs will provide regulatory and technical support to these efforts, but local people will do the bulk of the work to conserve and restore watersheds. Education is a fundamental part of the community based action. People must understand the needs of salmon in order to make informed decisions about how to make changes to their way of life that will accommodate clean water and the needs of fish.

Monitoring

The monitoring program combines an annual appraisal of work accomplished and results achieved. Work plans will be used to determine whether agencies meet their goals as promised. Biological and physical sampling will be conducted to determine whether water quality and salmon habitats and populations respond as expected to conservation and restoration efforts.

Appropriate Corrective Measures

The Oregon Plan includes an explicit process for learning from experience, discussing alternative approaches, and making changes to current programs. The Oregon Plan emphasizes improving compliance with existing laws rather than arbitrarily establishing new protective laws. Compliance will be achieved through a combination of education and prioritized enforcement of laws that are expected to yield the greatest benefits for salmon.

F. Voluntary Measures

There are many voluntary, non-regulatory, watershed improvement programs (Actions) that are in place and are addressing water quality concerns in the Umpqua Basin. Both technical expertise and partial funding are provided through these programs. Examples of activities promoted and accomplished through these programs include: planting of conifers, hardwoods, shrubs, grasses and forbs along streams; relocating legacy roads that may be detrimental to water quality; replacing problem culverts with adequately sized structures, and improvement/ maintenance of legacy roads known to cause water quality problems. These activities have been and are being implemented to improve watersheds and enhance water quality. Many of these efforts are helping resolve water quality related legacy issues.

Landowner Assistance Programs

A variety of grants and incentive programs are available to landowners in the Umpqua Basin. These incentive programs are aimed at improving the health of the watershed, particularly on private lands. They include technical and financial assistance, provided through a mix of state and federal funding. Local natural resource agencies administer this assistance, including the Oregon Department of Forestry, the Oregon Department of Fish and Wildlife, DEQ, and the National Resources Conservation Service.

Field staff from the administrative agencies provide technical assistance and advice to individual landowners, watershed councils, local governments, and organizations interested in enhancing the Watersheds. These services include on-site evaluations, technical project design, stewardship/conservation plans, and referrals for funding as appropriate. This assistance and funding is further assurance of implementation of the TMDL and WQMP.

Financial assistance is provided through a mix of cost-share, tax credit, and grant funded incentive programs designed to improve on-the-ground watershed conditions. Some of these programs, due to source of funds, have specific qualifying factors and priorities. Cost share programs include the Forestry Incentive Program (FIP), Stewardship Incentive Program (SIP), Environmental Quality Incentives Program (EQIP), and the Wildlife Habitat Incentive Program (WHIP).

Partnership for the Umpqua Rivers Action Plans

The Partnership for the Umpqua Rivers is a private, non-profit organization whose Directors represent various interests in Douglas County including the forest industry, agriculture, municipalities and special districts, conservation groups, and the general public.

The Partnership for the Umpqua Rivers has undertaken a basin-wide assessment and action planning effort on private lands within the Umpqua Basin. Each assessment has been completed following a process that involved local landowners. The assessments cover all those aspects of watershed health as set forth in the Oregon Watershed Enhancement Board's Watershed Assessment Manual.

In addition to the assessments, the Watershed Council developed Action Plans for each of its assessment areas. These Action Plans represent a comprehensive approach to improving water quality, fish habitat, and watershed health within the Umpqua Basin. The Action Plans are currently guiding the Council in its restoration efforts.

All of the assessments and action plans can be viewed on the PUR's website at: http://www.ubwc.org/Assessments.asp.

In addition, the Partnership for the Umpqua Rivers has completed Urban Assessments of the following cities in the basin:
Canyonville
Drain
Sutherlin
Winston
Yoncalla
Roseburg
Oakland

Each Urban Assessment examines modifications to the natural drainage system, land use planning and zoning, water transfer, and best management practices, both existing and recommended for the municipality. The assessments also include classifications of existing riparian vegetation within city limits.

Component 11: Monitoring and Evaluation

The intent of this element is to demonstrate long-term recovery, better understand natural variability, track management strategy and BMP effectiveness, and determine whether implementation of TMDL load allocations are achieving water quality standards. Monitoring and evaluation has three basic components: 1) monitoring the implementation of TMDL implementation plans and activities as described in this document; 2) evaluating the effectiveness of management practices; and 3) tracking water quality trends to ensure TMDL wasteload and load allocations are being achieved and water quality criteria are being met.

The information generated by each of these organizations will be pooled and used to determine whether management actions are having the desired effects or if changes in management actions and/or TMDLs are needed.

Although monitoring plans have not been developed yet in response to an approved TMDL, it is anticipated that monitoring efforts will consist of some or all of the following activities:

- Reports on the numbers and locations of projects, BMPs and educations activities completed
- In-stream monitoring to track progress towards achieving water quality numeric criteria
- Monitoring riparian vegetation communities and shade to assess progress towards achieving system potential targets established in the TMDL

Identification of organizations involved in TMDL monitoring

- ***Oregon Department of Environmental Quality:*** *In support of the ODEQ mission statement of restoring and protecting Oregon's water, air, and land, the Watershed Assessment section of ODEQ's Laboratory Division collects representative, valid environmental data through physical, chemical, and biological sampling and assessment. The Watershed Assessment section conducts water quality monitoring on several scales; ambient water quality monitoring of 151 fixed sites statewide, TMDL location-specific monitoring studies conducted on a TMDL priority schedule, and through support of over 40 watershed councils statewide and their volunteer monitoring studies. The ongoing ambient effort provides data for trends analyses. Except for special monitoring studies connected with the development of TMDLs, ODEQ's monitoring will not focus on specific monitoring for TMDL implementation.*

- **Oregon Department of Forestry***:* The Forest Practices Monitoring Program is responsible for monitoring the implementation and effectiveness of the forest practice rules and reporting those findings and recommendations to the Board of Forestry on an annual basis (OAR 629-635-0110 3d). The Board of Forestry considers the findings and recommendations and takes appropriate action with regard to rule revision. The role of monitoring is further articulated in the forest practice rules with regard to the water protection rules as per OAR 629-635-0110(3) and under statute with regard to stewardship plans referenced in 527.662(d) and sensitive resource sites referenced in 527.710 (3).

  The Forest Practices Monitoring Strategic Plan focuses on four types of monitoring to address forest practice program and Oregon Plan for Salmon and Watersheds (OPSW) goals and objectives. The monitoring strategy encompasses understanding of natural variability, implementation of best management practices ((BMPs) and BMP effectiveness. The monitoring types include implementation, effectiveness, trend, and validation.

  Implementation - The process of evaluating whether forest practice rules were complied with and whether voluntary measures were implemented. The objective is to assess whether the activities or rules were carried out as intended. An example of an implementation monitoring question is: "Was streamside vegetation maintained in accordance with the water protection rules?"

Effectiveness - The process of evaluating whether forest practices regulations achieve the desired goals for resource protection. The objective of this type of monitoring is to assess whether forest practice rules had the anticipated effect. An example of an effectiveness question is: "Are the water protection rules effective at preventing increases in stream temperatures that otherwise might occur from forest management activities?"

Trend - The process of evaluating patterns over time and space. The objective in this type of monitoring is to determine the range of conditions across the landscape and how such conditions change over time in response to management, restoration, and the OPSW. An example of a trend monitoring question is: "What are the riparian conditions in the Coast Range and how do those vary over time?"

Validation **-** The process of evaluating whether the original assumptions used to build the regulations were correct. The objective is to assess whether the assumptions underlying the design of the Forest Practices Act or specific rules were valid. An example of a validation monitoring question is: "Will the desired future condition of riparian area be met under the forest practices riparian management strategies?" Because validation monitoring requires addressing complex cause-and-effect questions, these issues will usually be pursued through research and other studies.

As part of the FPMP, ODF completed an analysis of forest practice compliance on non-federal forest lands in Oregon. This monitoring project determined rates of compliance for a large suite of forest practice rules, and the occurrence of water quality violations resulting from non-compliance. The monitoring project report and monitoring strategy are available on the ODF website at:
http://www.odf.state.or.us/divisions/protection/forest_practices/fpmp .

- **Oregon Department of Agriculture**: Under Senate Bill 1010 legislation, ODA is responsible for developing basin plans and rules known as Agricultural Water Quality Management Area Plans and Rules (Plans and Rules). These plans and rules are developed in consultation with Local Advisory Committees (LACs). Monitoring and reporting of plan and rules implementation and water quality improvements, with respect to agricultural lands in the basin, is the responsibility of ODA. Water quality and landscape monitoring is being conducted by ODA to evaluate plan and rules effectiveness and in support of the plan and rules reviews. ODA will use all available data to assess instream concentrations of nitrate/nitrite, dissolved oxygen, total phosphorus, E. *coli*, TSS, and pH for trend monitoring.

  ODA is also collecting data from aerial photographs on landscape conditions such as types of riparian vegetation. Other ground-based data are being collected on stream bank stability, shade, erosion, and vegetation use by livestock. These data can be consolidated to assess the condition of watersheds in the planning area.

- **Oregon Department of Transportation**: Oregon Department of Transportation (ODOT) has worked with ODEQ to develop a statewide TMDL program focused on managing TMDL pollutants associated with the operation, construction, and maintenance of ODOT highways. The ODOT TMDL program identifies sediment and temperature as primary TMDL pollutants of concern and outlines Best Management Practices (BMPs) ODOT uses to control these and other pollutants related to highway activities. ODOT measures the effectiveness of its TMDL program by measuring implementation of ODOT water quality BMPs, by performing research to assess effectiveness of representative BMPs, and by collecting data on ODOT storm water pollutants through research or miscellaneous ODOT water quality investigations. ODOT is now working with ODEQ to expand or refine ODOT monitoring activities to ensure they meet all ODEQ TMDL monitoring requirements.

The implementation of ODOT BMPs is measured through various ODOT tracking and inventory efforts. Examples include; inventorying water quality facilities installed as part of ODOT highway construction projects, tracking completion and implementation of spill prevention and storm water management plans developed for ODOT maintenance yards, compiling the ODOT Maintenance Progress Report which documents annual water resource protection efforts and BMPs performed by ODOT Maintenance forces. Tracking the implementation of ODOT water quality BMPs documents ODOT's efforts to manage TMDL pollutants as well as ODOT's efforts to meet a variety of other related water resource protection requirements.

ODOT measures the effectiveness of select or representative BMPs primarily through research projects. Research is performed on specific ODOT BMPs or highway practices to determine impacts they may have on the environment or how they influence pollutant transport or pollutant loads. ODOT uses research data and findings to characterize the pollutant loads associated with its highway facilities and operations and to adjust existing management practices to better control TMDLs or related pollutants. ODOT research projects tied to pollutant control, conducted since 2000, are listed below. Detailed descriptions of this research are available online at the ODOT website.

Current Research includes the following:

- Water Quality Facility Investigation
- Monitor Bioengineering Stabilization Project
- Culvert Condition Assessment and Database Development
- Assessing Effects of Flocculants to Manage Turbidity
- Dynamic Revetments for Coastal Erosion Stabilization

2000–2003 Research (Final Reports)

- Effects of Bromocil, Diuron, Glysophate and Sulfometuronmethyl on Periphyton Assemblages and Rainbow Trout (2003)
- Roadway Applications of Vegetation and Riprap for Streambank Protection (2002)
- Herbicide use in the Management of Roadside Vegetation, Western Oregon, 1999/2000: Effects on the Water Quality of Nearby Streams (2001)
- Roadwaste Management: Field Trials (2001)
- Evaluation of Infrared Treatment for Managing Roadside Vegetation (2000)
- Roadwaste Management: A Tool for Developing District Plans. (2000)
- Laboratory Comparison of Solvent Loaded and Solvent Free Emulsions. (2000)

ODOT also collects data on TMDLs and other pollutants associated with its storm water system through the pollutant monitoring that is performed as part of ODOT's National Pollutant Discharge Elimination System (NPDES) storm water management program. Storm water issues and problems routinely arise during ongoing maintenance of the ODOT storm water system and drive this monitoring. ODOT reports on this monitoring annually to ODEQ in NPDES annual reports. Examples include investigations of illicit discharges, characterization of ODOT storm water associated with ODOT highways or yards, and investigations of water quality problems associated with specific ODOT incidents or activities.

ODOT continues to work with ODEQ on the development of its TMDL program. Currently, ODOT is negotiating monitoring efforts that will be completed under the new ODOT MS4 NPDES permit to meet ODEQ TMDL concerns and management requirements.

- **Cities and Counties**: Larger jurisdictions may conduct their own water quality monitoring assessments and may maintain permanent monitoring networks. Smaller jurisdictions may need to partner with local watershed councils, Soil and Water Conservation Districts, or other partners.

It should be noted that the MS4 monitoring requirements might not fully cover all TMDL parameters, such as temperature. For example, temperature will need to be addressed in a TMDL Implementation Plan because it is not considered to be a significant contributor to stormwater pollution. Jurisdictions may have to submit both a TMDL Implementation Plan for nonpoint source TMDL pollutant monitoring not covered in the Stormwater Management Plan as well as the Stormwater Management Plan.

- **BLM and USFS**: Districts and regional offices are responsible for developing Water Quality Restoration Plans (WQRP) that describe any monitoring activities to be conducted by either agency.

Plan and schedule for reviewing monitoring information and revising TMDL

ODEQ will collect and review information for TMDL Implementation Plans on an annual basis and will periodically review available environmental data. However, an in-depth review of all data and information collected by all entities will be evaluated with the next Umpqua Basin TMDL cycle. Typically the evaluation would be done on a 5-year schedule; the next overall review for the Umpqua is currently planned for 2011.

In addition, the Technical Advisory Committee of the Partnership for Umpqua Rivers (formerly Partnership for the Umpqua Rivers) has compiled an inventory of all monitoring currently being conducted in the Umpqua Basin. Monitoring for TMDL implementation will build on existing monitoring programs.

Component 12: Public Involvement

To be successful at improving water quality a TMDL WQMP must include a process to involve interested and affected stakeholders in both the development and the implementation of the plan. In addition to the DEQ public notice policy and public comment periods associated with TMDLs and permit applications, future Umpqua Basin TMDL public involvement efforts will focus specifically on urban, agricultural and forestry activities. DMA-specific public involvement efforts will be detailed within the Implementation Plans included in the appendices and others which are not yet completed.

Public involvement can also be accomplished through direct association and contact with existing public groups that have an interest in the Umpqua Basin TMDLs. For example, Watershed Councils, League of Cities, Association of Counties, SB 1010 Local Advisory Committees, Councils of Government, federal and state agencies, and others will play important roles in development and implementation of the Umpqua Basin TMDL load allocations, WQMP, and individual Implementation Plans.

Component 13: Maintenance of Management Strategies

ODEQ administers a TMDL implementation program that will oversee the combined efforts of DMA Implementation Plans and ODEQ permitting programs. In response to Umpqua Basin TMDLs, each DMA will need to develop an Implementation Plan to address the TMDL parameters and load allocations affecting their jurisdiction. The Implementation Plan will describe the management strategies needed within each jurisdiction to achieve water quality standards. ODEQ will review each plan for adequacy. Each DMA will need to submit an annual report describing the implementation efforts underway and noting changes in water quality. ODEQ will review these plans and recommend changes to individual Implementation Plans if necessary. By 2012, ODEQ will re-evaluate the Umpqua Basin TMDLs and determine if the TMDL allocations are achieving water quality standards. Revised TMDLs may be prepared at that time, if necessary. This process is envisioned to continue on a five-year cycle after 2012. Taken together, these efforts should ensure that management strategies are maintained over time.

Component 14: Costs and Funding

Designated Management Agencies will be expected to provide a fiscal analysis of the resources needed to develop, execute and maintain the programs described in their Implementation Plans.

The purpose of this element is to describe estimated costs and demonstrate there is sufficient funding available to begin implementation of the WQMP. Another purpose is to identify potential future funding sources for project implementation. There are many natural resource enhancement efforts and projects occurring in the Watersheds which are relevant to the goals of the plan. These efforts, in addition to proposed future actions are described in the Management Measures element of this Plan.

Potential Sources of Project Funding

Funding is essential to implementing projects associated with this WQMP. There are many sources of local, state, and federal funds. The following is a partial list of assistance programs available in the Umpqua Basin.

Program	Agency/Source
Oregon Plan for Salmon and Watersheds	OWEB
Environmental Quality Incentives Program	USDA-NRCS
Wetland Reserve Program	USDA-NRCS
Conservation Reserve Enhancement Program	USDA-NRCS
Stewardship Incentive Program	ODF
Access and Habitat Program	ODFW
Partners for Wildlife Program	USDI-FSA
Conservation Implementation Grants	ODA
Water Projects	WRD
Nonpoint Source Water Quality Control (EPA 319)	DEQ,EPA
Riparian Protection/Enhancement	COE
Oregon Community Foundation	OCF
Clean Water State Revolving Fund (SRF) Low Interest Loans	DEQ

Grant funds are available for improvement projects on a competitive basis. Field agency personnel assist landowners in identifying, designing, and submitting eligible projects for these grant funds. For private landowners, the recipient and administrator of these grants is generally the local Soil and Water Conservation District or watershed council.

Oregon Watershed Enhancement Board (OWEB)

OWEB funds watershed improvement projects with state money. This is an important piece in the implementation of Oregon's Salmon Plan. Current and past projects have included road relocation/closure/ improvement projects, in-stream structure work, riparian fencing and revegetation, off stream water developments, and other management practices.

Individual grant sources for special projects have included Forest Health money available through the State and Private arm of the USDA Forest Service.

Component 15: Citation to Legal Authorities

A. Clean Water Act Section 303(d)

Section 303(d) of the 1972 federal Clean Water Act as amended requires states to develop a list of rivers, streams and lakes that cannot meet water quality standards without application of additional pollution controls beyond the existing requirements on industrial sources and sewage treatment plants. Waters that need this additional help are referred to as “water quality limited” (WQL). Water quality limited waterbodies must be identified by the Environmental Protection Agency (EPA) or by a state agency which has been delegated this responsibility by EPA. In Oregon, this responsibility rests with DEQ. DEQ updates the list of water quality limited waters every two years. The list is referred to as the 303(d) list. Section 303 of the Clean Water Act further requires that Total Maximum Daily Loads (TMDLs) be developed for all waters on the 303(d) list. A TMDL defines the amount of pollution that can be present in the waterbody without causing water quality standards to be violated. A WQMP is developed to describe a strategy for reducing water pollution to the level of the load allocations and waste load allocations prescribed in the TMDL, which is designed to restore the water quality and result in compliance with the water quality standards. In this way, the designated beneficial uses of the water will be protected for all citizens.

B. ORS 468B.020, Prevention of Pollution

The Oregon Department of Environmental Quality is authorized by law to prevent and abate water pollution within the State of Oregon pursuant to this statute.

(1) Pollution of any of the waters of the state is declared to be not a reasonable or natural use of such waters and to be contrary to the public policy of the State or Oregon, as set forth in ORS 468B.015.

(2) In order to carry out the public policy set forth in ORS 468B.015, the Department shall take such action as is necessary for the prevention of new pollution and the abatement of existing pollution by:
Fostering and encouraging the cooperation of the people, industry, cities and counties, in order to prevent, control and reduce pollution of the waters of the state; and
Requiring the use of all available and reasonable methods necessary to achieve the purposes of ORS 468B.015 and to conform to the standards of water quality and purity established under ORS 468B.048.

C. NPDES and WPCF Permit Programs

DEQ administers two different types of wastewater permits in implementing Oregon Revised Statute (ORS) 468B.050. These are: the National Pollution Discharge Elimination System (NPDES) permits for waste discharge; and Water Pollution Control Facilities (WPCF) permits for waste disposal. The NPDES permit is also a Federal permit and is required under the Clean Water Act. The WPCF permit is a state program. As permits are renewed they will be revised to insure that all 303(d) related issues are addressed in the permit.

D. Oregon Administrative Rules

The following Oregon Administrative Rules provide numeric and narrative criteria for parameters of concern in the Umpqua Basin:

TMDL Parameter: Nuisance Algal Growth, pH
Applicable Rules: OAR 340-041-0019
OAR 340-041-0021
OAR 340-041-0326(1)(b)

TMDL Parameter: Phosphorus
Applicable Rules: OAR 340-41-006
OAR 340-41-470(9)

TMDL Parameter: Temperature
Applicable Rules: OAR 340-041-0028

TMDL Parameter: Dissolved Oxygen
Applicable Rules: OAR 340-041-0016(1)(b)

TMDL Parameter: Bacteria
Applicable Rules: OAR 340-041-0009

E. Oregon Forest Practices Act

The Oregon Department of Forestry (ODF) is the designated management agency for regulation of water quality on non-federal forest lands. The Board of Forestry has adopted water protection rules, including but not limited to OAR Chapter 629, Divisions 635-660, which describes BMPs for forest operations. The Environmental Quality Commission (EQC), Board of Forestry, DEQ and ODF have agreed that these pollution control measurers will be relied upon to result in achievement of state water quality standards.

ODF and DEQ statutes and rules also include provisions for adaptive management that provide for revisions to FPA practices where necessary to meet water quality standards. These provisions are described in ORS 527.710, ORS 527.765, ORS 183.310, OAR 340-041-0026, OAR 629-635-110, and OAR 340-041-0120.

F. Senate Bill 1010

The Oregon Department of Agriculture has primary responsibility for control of pollution from agriculture sources. This is accomplished through the Agriculture Water Quality Management (AWQM) program authorities granted ODA under Senate Bill 1010 Adopted by the Oregon State Legislature in 1993. The AWQM Act directs the ODA to work with local farmers and ranchers to develop water quality management plans for specific watersheds that have been identified as violating water quality standards and have agriculture water pollution contributions. The agriculture water quality management plans are expected to identify problems in the watershed that need to be addressed and outline ways to correct the problems.

G. Local Ordinances

Within the Implementation Plans in the appendices, the DMAs are expected to describe their specific legal authorities to carry out the management measures they choose to meet the TMDL allocations. Legal authority to enforce the provisions of a city's NPDES permit would be a specific example of legal authority to carry out management measures.

WQMP ATTACHMENT A - DEPARTMENT OF AGRICULTURE PLAN

UMPQUA BASIN
AGRICULTURAL WATER QUALITY
MANAGEMENT AREA PLAN

Developed by

The Umpqua Basin Local Advisory Committee
and
The Oregon Department of Agriculture

January 10, 2001

Local Advisory Committee Members

Vern Bare	Dave Harris	Alternates:
Web Briggs	Don Kruse, Chair	Joe Brumbach
Ken Ferguson	James Mast	Jim Donnellan
JoAnn Gilliam	Kathy Panner	Stan Hendy
Janice Green	George Sandberg	Jan Tetreault
Bob Hall	Carol Whipple	

Table of Contents

ACRONYM LIST

AgWQM Area Plan - Agricultural Water Quality Management Area Plan
LAC - Local Advisory Committee
OAR - Oregon Administrative Rules
ODA - Oregon Department of Agriculture
ORS - Oregon Revised Statutes
OSU - Oregon State University
SB 1010 - Senate Bill 1010
SWCD - Soil and Water Conservation District
TMDL - Total Maximum Daily Load

PLAN REQUIREMENTS IDENTIFIED IN
OAR 603-090-0030

Description of the geographical area and physical setting of area.

List of water quality issues of concern. List of 303(d) parameters listed in the Umpqua basin (from the Department of Environmental Quality).

List of current designated beneficial uses that are adversely affected.

Statement 'Goal of the Umpqua Basin Agricultural Water Quality Management Area Plan is to prevent and control water pollution from agricultural activities and soil erosion and to achieve applicable water quality standards'.

Water Quality objectives of the area plan.

Description of the pollution prevention and control measures deemed necessary to achieve the goal.

A schedule for implementation of the necessary measures that is adequate to meet applicable dates established by law.

Guidelines for public participation.

Strategy for ensuring that the necessary measures are implemented.

To: AGRICULTURAL LANDOWNERS OF DOUGLAS COUNTY

From: The Umpqua Basin Local Advisory Committee

Regarding: The Umpqua Basin Agricultural Water Quality Management Area Plan

The Umpqua Basin Local Advisory Committee (LAC) has been working hard for the last 2 1/2 years to represent the views of agricultural landowners during the development of an Agricultural Water Quality Management Area Plan for agriculture in the Umpqua Basin.

This project officially began in 1993 when the Oregon Legislature passed Senate Bill 1010, which mandated the development of agricultural water quality plans for each of the major watersheds in Oregon. The bill specified that a local committee would work with the Oregon Department of Agriculture to develop a plan that would protect water quality while protecting the economic viability of agriculture in that region.

The Umpqua Local Advisory Committee was appointed by the Director of the Department of Agriculture in 1997, and is made up of 12 agricultural producers and 2 members from conservation interests. Small and large operations are represented, and every region in the county is represented. Douglas County Farm Bureau and the Douglas County Livestock Association are both well represented, and we have one representative from Umpqua Fishermen and one from the Steamboaters.

Recognizing the importance of this task, the Committee has invested a great deal of time and energy in developing a plan that would protect water quality while protecting landowners right to farm and graze livestock. After initial public review and comment in late 1999, the committee returned to work with two additional members and a great deal of public participation. The plan was essentially rewritten in order to address concerns presented during public comment and community participation.

The first task undertaken as we returned to work was to develop a Mission Statement and Statement of Goals and Intents. These statements are important groundwork for the entire plan, and should be read carefully by anyone who wants to understand the Umpqua Basin Agricultural Water Quality Management Area Plan for agriculture.

Sincerely,

Don Kruse, Chair LAC
George Sandberg, Chair of the Working Committee

Members of the Umpqua Local Advisory Committee: Vern Bare, Web Briggs, Ken Ferguson, JoAnn Gilliam, Janice Green, Bob Hall, Dave Harris, Don Kruse, James Mast, Kathy Panner, George Sandberg, Carol Whipple. Alternates: Joe Brumbach, Jim Donnellan, Stan Hendy, and Jan Tetreault

MISSION STATEMENT

Umpqua Basin Local Advisory Committee

To reduce agriculture's contribution to all forms of water pollution to the minimum level possible consistent with economically sound and sustainable farming and ranching.

Goals, Intent, Responsibilities of Umpqua Basin Local Advisory Committee

It is goal of the Umpqua Basin Local Advisory Committee (LAC) to develop a management plan for the Umpqua Basin, which will protect both the "right to farm and graze" and water quality.

It is the intent of the Umpqua Basin LAC that education be the primary driving force of the changes in agricultural practices necessary to improve water quality.

It is the intent of the Umpqua Basin LAC to help maintain the economic viability of farming and grazing in the Umpqua Basin.

It is the goal of the Umpqua Basin LAC that agricultural producers accept responsibility for agriculture's contribution to the failure to meet water quality standards, recognizing that all parts of the community must address their own contribution to the problem in order to reach our collective goal of improved water quality (sewage treatment facilities, aggregate companies, homeowners, and others).

It is the belief of the Umpqua Basin LAC that agriculture's share of the failure to meet water quality standards in the Umpqua Basin is quite small, relative to other contributions.

It is the goal of the Umpqua Basin LAC to develop a locally formulated agricultural water quality management area plan that will protect farmers and ranchers from frivolous lawsuits and layers of unnecessary regulation.

It is the intent of the Umpqua Basin LAC that the plan be flexible enough to allow landowners and land managers to use their own ingenuity and creativity to address water quality concerns. It is not the intent of the Umpqua Basin LAC to specify any particular agricultural practices.

It is the intent of the Umpqua Basin LAC to recognize the importance of voluntary associations and partnerships of farmers and landowners that join together in efforts to improve water quality (Watershed Councils, Neighborhood Associations, etc.).

It is the belief of the Umpqua Basin LAC that changes made in agricultural practices to improve water quality will also improve the economic viability of Basin farms and ranches.

It is the belief of the Umpqua Basin LAC that the majority of agricultural landowners are not major contributors to water quality problems in the Basin, but that most of us could make improvements in our practices that could have a cumulative positive effect on the Umpqua River.

It is the responsibility of the Umpqua Basin LAC to assist in identifying those conditions resulting from agricultural activities which could adversely impact water quality in the Umpqua Basin and identify them as "unacceptable conditions."

It is the intent of the Umpqua Basin LAC to provide the Oregon Department of Agriculture with a basis to work with those landowners that continue to maintain conditions that clearly qualify as "unacceptable conditions" as defined by the Umpqua Basin Agricultural Water Quality Management (AgWQM) Area Plan.

It is the intent of the Umpqua Basin LAC that fines and civil penalties be used only as a last resort, in situations where a landowner refuses to address a problem; and only in cases where an operation is clearly out of compliance, as demonstrated by appropriate testing. In those cases it is the intent of the Umpqua Basin LAC that fines be in relation to the scope of the violation and the size of the operation.

It is the intent of the Umpqua Basin LAC that constitutional rights be acknowledged, and that private property is entered only with owner permission or a valid search warrant.

It is the responsibility of the Umpqua Basin LAC to continue to be involved in the review of the Umpqua Basin AgWQM Area Plan to be certain that their intent is fulfilled.

INTRODUCTION

A basin plan, often referred to as a "1010 Plan" is a locally developed document that describes agricultural issues affecting water quality in that basin and defines how those situations will be addressed.

Correcting the problems that are causing water quality standards to be violated will be accomplished through several approaches. Educational efforts will be the primary method for providing long-term solutions and prevention of future problems. Technical and financial assistance will be provided to landowners through a number of agencies and organizations including the Douglas and Umpqua Soil and Water Conservation Districts (SWCD), Oregon State University (OSU) Extension Service, Natural Resource Conservation Service, etc. Monitoring will be ongoing to determine how well the industry is doing. If all other means fail, the Oregon Department of Agriculture will follow the enforcement process defined in this plan to assure that unacceptable conditions are corrected. Situations where the land manager is unwilling to correct an identified problem are expected to be rare.

The Oregon Plan for Salmon and Watersheds is Oregon's guideline for implementing stream restoration activities throughout the state. The Umpqua Basin Water Quality Management Plan for Agriculture will meet the objectives of the Oregon Plan and the Clean Water Act.

What does an Agricultural Water Quality Management Area Plan cover? A basin plan is developed to protect the "beneficial uses" of the waters of the state. The defined beneficial uses of water in the Umpqua Basin are identified in Table 1

Table 1 - Umpqua Basin (340-41-282)

Beneficial Uses	Umpqua R. Estuary to Head of Tidewater and Adjacent Marine Waters	Umpqua R. Main Stem from Head of Tidewater to Confluence of N. & S. Umpqua Rivers	North Umpqua River Main Stem	South Umpqua River Main Stem	All Other Tributaries to Umpqua, North & South Umpqua Rivers
Public Domestic Water Supply*		X	X	X	X
Private Domestic Water Supply*		X	X	X	X
Industrial Water Supply	X	X	X	X	X
Irrigation		X	X	X	X
Livestock Watering		X	X	X	X
Anadromous Fish Passage	X	X	X	X	X
Salmonid Fish Rearing	X	X	X	X	X
Salmonid Fish Spawning		X	X	X	X
Resident Fish & Aquatic Life	X	X	X	X	X
Wildlife & Hunting	X	X	X	X	X
Fishing	X	X	X	X	X
Boating	X	X	X	X	X
Water Contact Recreation	X	X	X	X	X
Aesthetic Quality	X	X	X	X	X
Hydro Power			X	X	X
Commercial Navigation & Transportation	X				

*****With adequate pretreatment (filtration and disinfection) and natural quality to meet drinking water standards

The types of pollution affecting water quality are called “parameters.” For example, a waterway listed for the parameter *Bacteria* could have been identified when water testing revealed high levels of E. coli bacteria which would impact the “beneficial uses” for water contact recreation (i.e. Swimming) and drinking or shell fish production in coastal waters. The types of pollution affecting waters in the Umpqua Basin (and all of Oregon) and the location where these problems are known to exist are identified on the Department of Environmental Quality 303(d) list.

The list of all the possible parameters includes:
- Bacteria
- Nutrients
- Temperature
- Sedimentation
- Turbidity *
- Toxics *
- Flow Modification
- Habitat Modification
- Total Dissolved Gases
- Biological Criteria
- Chlorophyll a
- Dissolved Oxygen
- pH
- Aquatic Weeds and Algae

*no current listings in the Umpqua Basin

Of the 14 possible parameters, the Umpqua Basin is listed for 12. Agricultural activity could impact the first 6 parameters, however there are no current listings for turbidity or toxics. This plan will address directly; sedimentation, nutrients, bacteria, and temperature, knowing that by improving in those areas there will be improvement on several other parameters (flow modification, dissolved oxygen, pH, aquatic weeds and algae, total dissolved gas, biological criteria and chlorophyll a).

WHAT IS THE PROCESS?

A Local Advisory Committee was appointed by the Director of the Oregon Department of Agriculture to represent local agricultural interests during the development of an Agricultural Water Quality Management Area Plan and Rules. The Umpqua Basin LAC studied Senate Bill (SB) 1010, SB 502, ORS 468(b), and the Coastal Zone Management Act. They worked to develop a plan for the Umpqua Basin which would place all regulation concerning water pollution in one plan, with Oregon Department of Agriculture as the agency responsible for the enforcement of the Umpqua Basin Administrative Rules.

Briefly, SB 1010 provides the authority for the Oregon Department of Agriculture to develop local water quality plans and rules. SB 502 provides that all issues relating to agricultural water pollution will be handled by the Oregon Department of Agriculture, and ORS 468.025 is Oregon

Statute passed by the legislature that states no person shall cause pollution of the waters of the State of Oregon[1]. In addition, in Oregon, Oregon Department of Agriculture had the responsibility for developing a plan for the Coastal Zone Management Act and regulations relating to pesticide use.
Placing the responsibility for all of the above with Oregon Department of Agriculture is intended to avoid having agricultural producers be required to deal with multiple agencies, and to have a consistent policy of enforcement for all water quality regulation relating to agriculture.

This Agricultural Water Quality Management Area Plan provides guidance for addressing agricultural water quality issues in the Umpqua watershed. 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 will exercise its enforcement authority for the prevention and control of water pollution from agricultural activities under administrative rules for the Umpqua watershed, and Oregon Administrative Rules 603-090-0060 through 603-090-0120.

The Administrative Rules for the Umpqua watershed set forth the requirements and/or prohibitions that will be used by the Oregon Department of Agriculture 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 Oregon Department of Agriculture.

Text outlined by a box will be a part of the administrative rule.

> These rules have been developed to implement a water quality management area plan for the Umpqua Basin Agricultural Water Quality Management Area pursuant to authorities vested in the department through ORS 568.900-568.933 and ORS 561.190 - 561.191, due to a determination by the Environmental Quality Commission to establish Total Maximum Daily Loads (TMDL) and allocate a load to agricultural nonpoint sources. The area plan is known as the Umpqua Basin Agricultural Water Quality Management Area Plan. After adoption of the TMDLs, these rules will be reviewed and modified as needed to provide reasonable assurance that the load allocations for agriculture will be met.
>
> Nothing in the Umpqua Basin Agricultural Water Quality Management Area Plan or Rules adopted by the department will allow the department to implement this plan or rules in a manner that is in violation of the U.S. Constitution, the Oregon Constitution or other applicable state laws.

Description of The Geographical Area And Physical Setting Of Area

The Umpqua Basin includes the drainage area for the South Umpqua, the North Umpqua, the mainstem Umpqua and the Smith River (Map 1). The land base under this plan includes all agricultural and rural lands within the Umpqua Basin except for public lands managed by federal

1 ORS 468B.025(1) states: ...no person shall:
(a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
(b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.

agencies (Bureau of Land Management, US Forest Service and US Fish and Wildlife Service), and activities subject to the Forest Practices Act.

Of the 2,876,000 acres in Douglas County, 16 percent is classified as agricultural lands, 74 percent as forest, and 10 percent as urban and other (Douglas County Planning Department). The majority of the agricultural lands is used for grazing and permanent hay fields. In 1996, the total estimated agricultural gross receipts for Douglas County were $69.8 million for animal and crop sales 2 . Agricultural production includes livestock, hay and silage, wine grapes, small grains, fruit crops, Christmas trees, and vegetables (truck crops).

The South Umpqua Subbasin and the Mainstem Subbasin lie between the Coast Range to the west and the Cascade range to the east. Valleys associated with tributaries to these rivers are mostly narrow and widely scattered. The South Umpqua river is generally wide, shallow, and slow moving close to the Mainstem, but can be in a steep gradient channel higher in the watershed. The South Umpqua has a very strong fall chinook run that has adapted to spawning in mainstem reaches rather than in small tributaries as coho. Most of the agricultural activities in the Umpqua basin take place in the central valley.

The entire eastern portion of the Umpqua basin is along the west slope of the Cascade Range. Beginning in the foothills east of the central valley, the terrain rises quickly, eventually reaching elevations over 9,000 feet. The North Umpqua River tends to be in an incised channel with a steep gradient. The water in the North Umpqua remains cooler than the South Umpqua and is an important source of cooler water to the main stem Umpqua where the North Umpqua and South Umpqua join. The North Umpqua with its geology and flow regime supports very strong steelhead runs. Agriculture is limited in the North Umpqua Basin as most of the land is in public ownership and is poorly suited for agriculture, although, there is some area below Little River linked to agriculture.

The Smith River Subbasin is on the west side of the Coast Range and is characterized by a 25 mile long estuary whose tributaries provide important coho habitat. The headwaters of the Smith River tend to have high gradient, steeply incised channels that widen out into meandering, wide channels in the floodplains. Agriculture primarily occurs in the lower reaches of the subbasin along these floodplains.

Water Quality Objectives for Area Plan

The Administrative Rules for this program require that the following statement be included in this plan. “The Goal of the Umpqua Basin Water Quality Management Area Plan is to prevent and control water pollution from agricultural activities and soil erosion and to achieve applicable water quality standards.”

In addition, a part of the federal Coastal Zone Amendments Reauthorization Act enacted by Congress in 1990, Section 6217(g), specifically addresses the impacts of nonpoint source pollution in coastal areas by requiring each state with an approved coastal zone management program to develop and submit to the U.S. Environmental Protection Agency and the National Oceanic and Atmospheric Administration, a Coastal Nonpoint Pollution Control Program. The purpose of the program "shall be to develop and implement management measures for nonpoint source pollution

[2] From Oregon State University, Oregon County and State Estimates. Agricultural Resources Department, Oregon State University, 1998.

to restore and protect coastal waters, working in close conjunction with other state and local authorities." As part of the Coastal Zone Program, the State of Oregon presented agricultural management measures to meet the requirements of the Coastal Zone Amendments Reauthorization Act Section 6217(g) and identified the SB1010 program as agriculture's means to address the provisions of the state plan developed in response to the act. The measures identified under 6217(g) have been found to be effective to control and prevent agricultural water pollution and are listed in Appendix A. This plan represents the state's program to address agricultural pollution as provided for in Coastal Zone Amendments Reauthorization Act .

Pollution Prevention and Control

This section describes potential pollution sources and provides a plan to reduce and prevent water pollution. When combined with other provisions of this plan and pollution control efforts for other land uses, it will help achieve water quality standards. This section has been developed around the water quality standards listed in the Umpqua Basin which are directly affected by agricultural activity: sedimentation, nutrients, bacteria, and temperature. For each of these parameters, the committee identified:

- Information about the parameter to provide basic understanding of the reason for concern.
- A statement identifying the unacceptable condition which will be reflected in the Oregon Department of Agriculture Administrative Rules.
- Steps which will be taken by the Oregon Department of Agriculture when investigating a complaint.
- Examples of situations which could lead to an unacceptable condition. These examples are provided to alert landowners and managers to potential problems, rather than to prescribe particular treatments.

All landowners or operators conducting activities on lands in agricultural use shall be in compliance with the following criteria (refers to unacceptable conditions in boxes). A landowner is responsible for only those conditions caused by agricultural activities conducted by the landowner. A landowner is not responsible for unacceptable conditions resulting from the actions of another landowner. Conditions resulting from unusual weather events or other exceptional circumstances are not the responsibility of the landowner.

Thus, landowners are responsible only for an unacceptable condition caused by management activities on their lands. For example, streambank erosion can and will occur and may be outside the landowner's control.

Following are the pollution prevention and control measures for the listed parameters of concern that agriculture may affect in the Umpqua Basin.

Sediment

Soil erosion is a natural process, but land management practices can accelerate the process or slow it down. For a farmer or rancher, soil loss means a loss of their land productivity. When soil moves into a stream and is deposited along the streambed, it is called sedimentation. Excess sediment in streams creates a number of problems, including negatively impacting drinking water quality, fish spawning grounds, and harbor management. It is in everyone's best interest to keep soil on agricultural land.

It is the responsibility of the Umpqua Basin LAC to identify those conditions resulting from agricultural activities which would seriously impact water quality in the Umpqua Basin and identify them as "unacceptable conditions."

Unacceptable Condition Addressing Sediment

Substantial amounts of sediment (i.e. in excess of water quality standards for sedimentation 3) moving from agricultural lands into waters of the state as a result of agricultural activities is identified as an unacceptable condition. Offstream ponds which do not contribute to the downstream system under normal weather conditions are exempt as they are often used to trap and contain sediment.

When a condition comes to the attention of the Oregon Department of Agriculture, which appears to be in violation of the sediment rule, every practical means shall be used to make a proper determination of the source of the sediment, the cause of the sediment movement, and the degree of the problem. Appropriate testing will be conducted to verify that sediment levels of waters leaving agricultural land are in excess of water quality standards (described under footnote 3). Turbidity testing may be the best available test for locating the sources of sediment.

Water quality monitoring can be done by landowners to assess their own situation. Help is available through OSU Extension, Oregon Cattlemen's Association, DEQ, and others to develop an appropriate monitoring program. The Oregon Department of Agriculture and the Umpqua Basin LAC encourage landowners to become involved in water quality monitoring.

Situations which could contribute to a violation of the sediment rule:

(This list is not intended to cover all possibilities, nor will these situations always result in violation of the "sediment rule." It is provided to help landowners assess the potential problems on their lands.)
Land disturbing farming activities such as plowing, discing, or rototilling so close to a waterway that the remaining near stream vegetation does not have the capacity to filter sediment adequately.
Roads located in proximity to waterways which are not adequately surfaced or seeded.
Intense and continual livestock use of the near stream area, leading to substantial reduction of ground cover and vegetation.
Location of livestock feeding sites in the area near a stream.
Stream crossings whether for livestock or vehicles and equipment which are "mudded out" (excessively muddy and unstable soil).
Over irrigation of soils likely to erode, such as recently farmed land, leading to rill or gully erosion.
Harvest of Christmas trees, tree seedlings, or root crops during the rainy season without adequate near stream vegetation or other precautions to filter sediment adequately.

MANY OF THE PRACTICES WHICH WOULD CONTRIBUTE SEDIMENT TO A WATERWAY ARE ALREADY COVERED BY REGULATIONS IN ORS 468B. HOWEVER, THEY ARE INCLUDED IN THIS PLAN SO THAT ENFORCEMENT ACTION IS HANDLED BY THE ODA UNDER THE SAME ENFORCEMENT PROCEDURES AS THE UMPQUA BASIN AgWQM ADMINISTRATIVE RULES VIOLATIONS. THUS, LANDOWNERS ARE AFFORDED THE SAME OPPORTUNITY FOR TESTING AND APPEAL AS DESCRIBED IN THIS PLAN.

---

3 OAR 340-041-0285(2) (2000 edition) states
(j) the formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry shall not be allowed.

Ditch maintenance and repair are presently subject to the Oregon's Removal-Fill Law (ORS 196.800-990). This Umpqua Basin Agricultural Water Quality Management Area Plan requires no additional conditions for those sites and activities subject to the Oregon Removal-Fill Law.

Schedule for Rule Implementation:
The rule will go into effect one year after the Administrative Rules are filed with the Office of the Secretary of State subject to enforcement procedures described on page 18.

Nutrients

Nutrients, such as nitrogen, phosphorous, potassium, and sulfur are critical to plant growth. In fact the beautiful sub-clover pastures for which Douglas County is known are made possible by annual applications of phosphorous and sulfur. For many landowners, fertilizer is a significant budget item and managing those nutrients effectively is essential to productive and profitable farming and ranching in Douglas County. However, when nitrogen and phosphorous enter streams, they can have a very negative impact. Excess nitrogen and phosphorus contribute to increased aquatic weeds and algae growth, slowing water movement which leads to warmer water temperatures, and reduced dissolved oxygen levels available to fish. Keeping nutrients in the soil and out of waterways is a win–win situation.

It is the responsibility of the Umpqua Basin LAC to identify those situations resulting from agricultural activities which would seriously impact water quality in the Umpqua Basin and identify them as “unacceptable conditions.”

Unacceptable Condition Addressing Nutrients

Substantial amounts of phosphorous (i.e. in excess of water quality standards 4) moving from agricultural lands into waters of the state as a result of agricultural activities is identified as an unacceptable condition.

When a condition comes to the attention of the Oregon Department of Agriculture, which appears to be in violation of the nutrient rule, every practical means shall be used to make a proper determination of the source of the nutrient, the cause of the nutrient movement, and the degree of the problem. Appropriate testing will be conducted to verify that phosphorous levels of waters leaving agricultural land are in excess of water quality standards (see footnote 4 for description phosphorous standard).

Water quality monitoring can be done by landowners to assess their own situations. Help is available through OSU Extension, Oregon Cattlemen’s Association, Umpqua Basin Watershed Council, DEQ, and others. The Oregon Department of Agriculture and Umpqua Basin LAC encourage landowners to get involved in water quality monitoring.

Situations which could contribute to nutrient contamination of waterways include

(This list is not intended to cover all possibilities, nor will these situations always result in violation of the “nutrient rule.” It is provided to help landowners assess the potential problems on their lands.)
Placement of fertilizer in a waterway or so near to a waterway that runoff carries it into the waterway.

---

[4] When levels of P exceed 0.1 mg per liter, they are above acceptable water quality standards

Location of an animal feeding area, or other concentration of animals so near to a waterway that animal waste is carried into the water way.
Placement of barn maintenance waste so near to a waterway that runoff moves nutrients into the waterway.
Irrigation practices which result in nutrient laden surface runoff returning to the waterway.
Soil erosion that carries soils high in nitrogen or phosphorus into a waterway.
Over-irrigation which moves nitrogen into the ground water, returning to waterways through sub surface runoff.

MANY OF THE PRACTICES WHICH WOULD CONTRIBUTE NUTRIENTS TO A WATERWAY ARE ALREADY COVERED BY REGULATIONS IN ORS 468B, HOWEVER, THEY ARE INCLUDED IN THIS PLAN SO THAT ENFORCEMENT ACTION IS HANDLED BY THE ODA UNDER THE SAME ENFORCEMENT PROCEDURES AS THE UMPQUA BASIN AgWQM ADMINISTRATIVE RULES VIOLATIONS. THUS, LANDOWNERS ARE AFFORDED THE SAME OPPORTUNITY FOR TESTING AND APPEAL AS DESCRIBED IN THIS PLAN.

Schedule for Rule Implementation:
The rule will go into effect one year after the Administrative Rules are filed with the Office of the Secretary of State subject to enforcement procedures described on page 18.

Bacteria

Bacteria, such as E. Coli, can represent a serious hazard to human health. People are exposed to water-borne bacteria while swimming, fishing, water skiing, etc. Those of us who work in agriculture are less susceptible to local bacteria as a result of routine exposure. However, many people are at risk for bacterial disease, particularly the very young and elderly and those who have weakened immune systems due to poor health or medical treatments. Agricultural activities could be one source of bacterial contamination of water. Streams and rivers can also be contaminated by wildlife, leaking septic systems, sewage spills, etc.

It is the responsibility of the Umpqua Basin LAC to identify those situations resulting from agricultural activities which would seriously impact water quality in the Umpqua Basin and identify them as “unacceptable conditions.”

Unacceptable Condition Addressing Bacteria

Substantial amounts of bacteria (i.e. in excess of water quality standards[5]) moving from agricultural lands into waters of the state as a result of agricultural activities is identified as an unacceptable condition. Off stream ponds which do not contribute to waters where public exposure is possible are exempt from this rule.

[5] OAR 340-041-0285(e) (2000 edition) states organisms of the coliform group commonly associated with fecal sources shall not exceed (1) in freshwater and estuarine waters other than shellfish growing waters - a 30-day log mean of 126 E. coli organisms per 100 ml, based on a minimum of five samples and no single sample shall exceed 406 E. coli organisms per 100 ml., (2) in marine waters and estuarine shellfish growing waters - a fecal coliform median concentration of 14 organisms per 100 milliliters, with not more than ten percent of the samples exceeding 43 organisms per 100 ml.

In this standard the number of organism refers to the number of colonies that develop on a petri dish from a sample of water.

When a condition comes to the attention of Oregon Department of Agriculture which appears to be in violation of the bacteria rule, every practical means shall be used to make a proper determination of the source of the bacteria, the cause of the bacterial movement, and the degree of the problem. Appropriate testing will be conducted to determine if bacteria levels in waters leaving agricultural land are in excess of water quality standards (see footnote 5 for description of bacteria standard).

Water quality monitoring can be done by landowners to assess their own situations. Help is available through OSU Extension, Oregon Cattlemen's Association, DEQ, and others to develop an appropriate monitoring program. The Oregon Department of Agriculture and the Umpqua Basin LAC encourage landowners to become involved in water quality monitoring.

Situations which could contribute to the bacterial contamination of waterways include:

(This list is not intended to cover all possibilities, nor will these situations always result in violation of the "bacteria rule." It is provided to help landowners assess the potential problems on their lands.)
Location of an animal feeding area, or other concentration of animals so near to a waterway so that animal waste is carried into the waterway.
Placement of barn maintenance waste so near to a waterway that runoff moves bacteria into the waterway.
Irrigation practices which result in bacteria laden surface runoff returning to the waterway.
Disposing of carcasses, or any other bacteria laden debris near a waterway.

MANY OF THE PRACTICES WHICH WOULD CONTRIBUTE BACTERIAL CONTAMINATION TO A WATERWAY ARE ALREADY COVERED BY REGULATIONS IN ORS 468B, HOWEVER, THEY ARE INCLUDED IN THIS PLAN SO THAT ENFORCEMENT ACTION IS HANDLED BY THE ODA UNDER THE SAME ENFORCEMENT PROCEDURES AS THE UMPQUA BASIN AgWQM ADMINISTRATIVE RULES VIOLATIONS. THUS, LANDOWNERS ARE AFFORDED THE SAME OPPORTUNITY FOR TESTING AND APPEAL AS DESCRIBED IN THIS PLAN.

Schedule for Rule Implementation:
The rule will go into effect one year after the Administrative Rules are filed with the Office of the Secretary of State subject to enforcement procedures described on page 18.

Temperature

Water temperature above water quality standards is the single largest category for 303(d) listing of streams in the Umpqua Basin and in Oregon. This is also the most controversial listing parameter, as warm temperatures are often viewed as a concern solely for fish. In reality temperature has a dramatic impact on water quality because warm water temperatures along with available nutrients encourage weed and algae growth. The end result is slower water movement, further increasing in water temperature, reduced oxygen in the water, and lower pH.

River temperatures in the Umpqua Basin often reach the 80's, so a goal of 64ºF when salmonid fish rearing occurs, and 55ºF when native salmonid spawning, egg incubation, and fry emergence from the egg and from the gravels occur, seems out of reach to many in agriculture. However, landowners may be able to reduce the rate of warming of water by encouraging vegetation which will shade streams, and by using irrigation water as efficiently as possible.

Perennial Streams – those streams that flow above ground throughout the year, and are contributing to the downstream system during July, August, September or October, during the majority of years, are of concern as temperature is considered.

Unacceptable Condition Addressing Temperature

> Agricultural management or soil-disturbing activities that preclude establishment and development of adequate riparian vegetation for streambank stability and streambank shading, consistent with site capability, along a perennial stream which has a site potential for such vegetation is considered an unacceptable condition. Minimal breaks in shade vegetation for essential management activities are considered appropriate.
>
> Irrigation practices that contribute significant amounts of warmed surface water 6 back into a stream are considered an unacceptable condition.

When a condition comes to the attention of the Oregon Department of Agriculture, that appears to be a violation of the temperature rule, every practical means shall be used to make a proper determination as to the agricultural activity's impact on stream temperature. Appropriate analysis will be conducted to verify that agricultural activity is resulting in a loss of shade producing vegetation, that the site has the potential for effective shading vegetation; or that warmed irrigation water is returning to the stream.

Monitoring of stream temperatures, riparian vegetation, and evaluation of irrigation systems can be done by landowners to assess their own situations. Help is available through OSU Extension, Oregon Cattlemen's Association, DEQ, and others. The Oregon Department of Agriculture and the Umpqua Basin LAC encourage landowners to become involved in water quality monitoring.

Situations that could contribute to increased stream temperatures include:

(This list is not intended to cover all possibilities, nor will these situations always result in violation of the "temperature rule," it is provided to help landowners assess potential problems on their lands.)
Removal of vegetation from theriparian area of a perennial stream which would have provided effective shading.
Grazing management that does not allow vegetation to establish, which would provide effective shade along a perennial stream.
Farming practices that do not allow vegetation to establish, that would provide effective shade along a perennial stream.
Allowing surface returns of surplus irrigation water.
Use of irrigation water in excess of crop needs or soil water holding capacity.

Schedule for Rule Implementation:
The rule will go into effect one year after the Administrative Rules are filed with the Office of the Secretary of State subject to enforcement procedures described on page 18.

Waste Management

ORS 468B.025 is an existing statute which was developed to address water pollution from waste discharge. As stated earlier, SB 502 was passed in 1995 to ensure that ODA is the state agency

[6] Irrigation systems that allow more than 3% of water pumped during any one irrigation setting to return as surface runoff to a stream.

responsible for direct regulation of farming activities for the purpose of protecting water quality. To implement SB502, the department is incorporating ORS 468B.025 and 050 into all of the AgWQM area plans in the state. ORS 468B.025 and 050 have been incorporated for the purposes of this plan by including the following language in the rules that effectuate this plan.

Unacceptable Condition Addressing Waste Management

Effective upon adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or ORS 468B.050.

ORS 468B.025(1) states:
...no person shall:
(a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
(b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.

ORS 468B.050 identifies the conditions when a permit is required. In agriculture under state rules these are referred to as Confined Animal Feeding Operations and are operations that confine animals for more than four months per year and have a waste water treatment facility.
Definitions:
"Pollution" has the meaning given in ORS 468B.005(3) which states: "such alteration of the physical, chemical or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the state, which will or tends to, either by itself or in connection with any other substance, create a public nuisance or which will or tends to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof."

"Wastes" has the meaning given in ORS 468B.005(7) which states: 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.

Other substances which will or may cause pollution include commercial fertilizers, soil amendments, composts, animal wastes, and vegetative materials.

Schedule for Rule Implementation:
As this is an existing statute, this rule will go into effect when the Administrative Rules are filed with the Office of the Secretary of State subject to enforcement procedures described on page 18.

Pesticide control is presently regulated by authorities granted to the Oregon Department of Agriculture under ORS 634 and through OAR 603.57. Waterbodies in the Umpqua Basin have not been identified under 303(d) for pesticide contamination. Carefully following label instructions and implementing integrated pest management strategies can generally reduce pesticide use, increase yields, increase net returns, minimize surface and ground water exposure to pesticides, and decrease economic risk. Proper pesticide use begins with reading the label on the container and following the instructions. As required by ORS 634.372(2), users of pesticides must follow label recommendations for both restricted and nonrestricted use pesticides.

ENFORCEMENT PROCEDURES

The Oregon Department of Agriculture's primary mission is to support Oregon's agricultural industry. The Oregon Department of Agriculture will have the responsibility for enforcing rules derived from the Umpqua Basin Agricultural Water Quality Management Area Plan. It is the intent of the Local Advisory Committee that fines and civil penalties be used as a last resort in the effort to improve water quality in the Umpqua Basin. This is consistent with the direction given to the Department through the Oregon Administrative Rules for the Agricultural Water Quality Management Program (603-090-0000 through 603-090-0120). This Area Plan includes an enforcement policy because it is a required element of a Water Quality Plan, and to provide a mechanism when reasonable attempts at voluntary solutions have failed.

The primary focus of the Umpqua Basin AgWQM Area Plan is education toward voluntary compliance with the plan. Even the enforcement procedure is designed to educate first and penalize only as a last resort.

In the event that a situation comes to the attention of the Oregon Department of Agriculture which may be a violation of the Umpqua Basin Agricultural Water Quality Administrative Rules, a prescribed procedure will be followed. EXCEPT FOR FLAGRANT[7] POLLUTION OF WATERS OF THE STATE OR FLAGRANT DESTRUCTION OF ADEQUATE RIPARIAN VEGETATION ALONG PERENNIAL STREAMS, AT ANY POINT IN THE PROCESS, THE LANDOWNER MAY CHOOSE TO ADDRESS A PROBLEM AND NO CIVIL PENALTIES WILL BE LEVIED BY THE OREGON DEPARTMENT OF AGRICULTURE.

Any person alleging a violation of the Umpqua Basin Agricultural water quality administrative rules may file a complaint with the Oregon Department of Agriculture. The department will evaluate or investigate a complaint filed by a person if the complaint is in writing, signed, and dated by the complainant, and indicates the location and description of the violation of the Umpqua Basin Agricultural Water Quality Administrative Rules.

If the problem appears to be a violation of the Umpqua Basin Agricultural Water Quality Administrative Rules, an Oregon Department of Agriculture representative will contact the landowner to schedule a meeting. NO OREGON DEPARTMENT OF AGRICULTURE REPRESENTATIVE WILL ENTER PRIVATE PROPERTY *AT ANY TIME* WITHOUT THE OWNER'S PERMISSION OR A VALID SEARCH WARRANT.

The situation will be reviewed on-site by an Oregon Department of Agriculture representative and the landowner. The on-site review will include an investigation by the Oregon Department of Agriculture which may include collecting appropriate samples for testing and consultation with experts as appropriate, at the Oregon Department of Agriculture's expense. If no problem exists, the complaint would be dropped.

If the Oregon Department of Agriculture determines through the investigation that a violation of the Umpqua Basin Agricultural Water Quality Administrative Rules exists, the Oregon Department of Agriculture will advise the landowner of the violation (i.e. issue a notice of noncompliance) and work with the landowner to develop a plan of correction to solve the problem. The plan of correction includes a timetable and an agreement to revisit the site as necessary to confirm that progress is being made to correct the violation within the timetable agreed upon. This would complete the process.

7 As defined in OAR 603-090-0060(2) - any violation where the respondent had actual knowledge of the law and knowingly committed the violation

If the landowner does not agree that a problem exists, the landowner may choose to do additional testing or consultation at their own expense and request a review by the department of the initial findings in light of any additional information collected.

If evaluation of the additional information by the Oregon Department of Agriculture determines that no problem exists or that the violation is not the result of an agricultural practice by the landowner, the process is complete.

If there is a confirmed problem that a landowner refuses to address after the department's on-site visit and the department's attempts to work with the landowner to develop a mutually agreeable solution, civil penalties can be levied. Civil penalties are issued by the Oregon Department of Agriculture Director or the director's designee and will be based on the seriousness of the violation and the magnitude of the effect. OAR 603-090-0120(3) describes the civil penalty matrix for first violations which begins at $50 and ranges to $1200, and the civil penalty matrix for repeat violations which begins at $100 and ranges to $5000. ORS 568.933 states "each day of violation continuing after the period of time for correction set by the department shall be considered a separate violation unless the department finds that a different period of time is more appropriate to describe a specific violation event."

A landowner issued a civil penalty due to a violation of the Umpqua Basin Agricultural Water Quality Administrative Rules may request a hearing with the Director of the Department of Agriculture. The hearing provides for the director to hear the landowners disposition from which the director determines appropriate action which can include a modification of the civil penalty or other form of intermediate sanction.

A landowner issued a civil penalty due to a violation of the Umpqua Basin Agricultural Water Quality Management Area Administrative Rules may request a formal hearing by a hearings officer assigned from the Hearing Officer's Panel in accordance with applicable contested case procedures as described in ORS183.413 to 183.550. Upon conclusion of the hearings process, a hearings officer will prepare a proposed order that includes recommended findings of fact, conclusions of law, and appropriate action by the agency. If the order is in favor of the landowner, the process is complete. If not, the landowner becomes subject to procedures for payment of the civil penalty.

NO CIVIL PENALTIES WILL BE ISSUED DURING THE FIRST TWO YEARS FOLLOWING PLAN ADOPTION, UNLESS THERE IS FLAGRANT POLLUTION OF WATERS OF THE STATE OR FLAGRANT DESTRUCTION OF ADEQUATE RIPARIAN VEGETATION ALONG PERENNIAL STREAMS.

THE PROCESS IS DESIGNED TO BE FAIR TO THE LANDOWNER AND TO ALLOW ENFORCEMENT OF THE UMPQUA BASIN AGRICULTURAL WATER QUALITY ADMINISTRATIVE RULES. AS INDICATED IN OAR 603-090-0020 THIS IS AN ITERATIVE PROCESS. THIS PROCESS INCLUDES A REVIEW EVERY TWO YEARS BY THE LAC TO PROVIDE CONTINUED ADVICE TO THE ODA ON MODIFICATION TO THE PLAN AND RULES THAT MAY BE NECESSARY.

EDUCATION

The goal of the Umpqua Basin education effort is to create a high level of awareness and an understanding of water quality issues among the agricultural community and the rural public, in a manner which encourages cooperative efforts through education and technical assistance. When agricultural land managers recognize that measures that protect water quality can also improve their profitability, progress toward improved water quality will be much more rapid.

Water quality projects will be used as educational demonstrations. Each water quality project should be reviewed with two concerns: 1) what will this do to improve water quality or fish habitat AND, 2) how will this project improve the farm or ranch's productivity. For example, a new livestock watering system may reduce impact to the stream and streambank AND provide clean water for livestock, or a new fence may protect a streambank AND provide another pasture division which improves grazing management.

Educational programs will address the relationship of practices on water quality and agricultural productivity. Some examples are listed below.

Riparian Area Management

Riparian areas are important in influencing water quality. Managing riparian areas separately from upland areas can lead to increased productivity in terms of agriculture and water quality. Healthy riparian areas perform many functions:
Stabilize streambanks and reduce erosion potential.
Provide vegetation and shade to moderate stream temperature.
Provide forage for grazing livestock.
Provide wildlife habitat and connecting corridors for wildlife movement.
Add large woody debris and fine organic matter to the stream channel.
Slow overland runoff into streams and filter out nutrients and sediment before they reach the stream.

Good management of riparian areas in conjunction with farming and grazing is possible! Many ranchers in Douglas County have successfully protected stream banks and riparian vegetation while farming and grazing. Sensitive areas can be protected with managed, timely riparian grazing, proper stocking rates, off channel watering, buffer strips, and temporary or permanent fences where appropriate.

Livestock and Pasture Management

Well-managed pastures provide excellent ground cover and protect soil resources and water quality. Pastures have a relatively low requirement for applied fertilizer, which means that there is very little potential for fertilizer impact on waterways. Grazing as an agricultural practice can greatly reduce the need for broadcast pesticides. Productive pastures are high in organic matter, which improves water infiltration and water retention, reducing runoff. Pasture plants have a remarkable ability to recycle nutrients from manure and urine, and a well established, healthy pasture will utilize 90% of the nitrogen, phosphorous, potassium, and sulfur within the square yard where it was deposited[8]. When pastures are managed so that nutrients are recycled, water quality is protected AND dollars spent on fertilizer are reduced.

[8] From Gerrish, J., 1997, Introduction to Management Intensive Grazing. In 1997 Missouri Grazing Manual, University of Missouri Extension Publication.

Irrigation Management
Landowners benefit from proper irrigation water use by maximizing water use efficiency and minimizing waste. Improved irrigation systems and irrigation management conserves water, protects water quality, AND reduces pumping costs and loss of soil nutrients.

Estuarine Management
A sizable portion of agricultural ground in coastal Douglas County is protected from tidewaters with a system of dikes, ditches and tidegates. Farmers and ranchers in these areas must maintain these systems in order to maintain the productivity of these pastures and hay fields.

EDUCATION PLAN

The Oregon Department of Agriculture will coordinate the development of SB 1010 education projects within the Umpqua Basin with the Douglas and Umpqua Soil and Water Conservation Districts. They will work hand in hand with US Department of Agriculture's Natural Resource Conservation Service, the OSU Extension Service, and the Partnership for the Umpqua Rivers to carry out an effective water quality education program.

To define, implement, and measure the success of the Umpqua Basin education effort, the following quantifiable tasks can be pursued:
1. Conduct education programs to promote public awareness of water quality issues.
Hold workshops on water quality issues and the conservation practices that will help improve water quality.
Develop demonstration projects to highlight successful conservation practices and systems.
Organize tours of demonstration projects for agricultural managers and producers.
Produce and distribute brochures about water quality issues.
Prepare standard presentations for agricultural producer groups.
Develop detailed, one-page Umpqua Basin fact sheets for erosion control, nutrient and waste management, livestock and grazing management, and riparian and streambank management.
Conduct one-on-one and small group visits with landowners to discuss the Umpqua Basin AgWQM Area Plan and adaptive management solutions.

2. Conduct a media program to inform Umpqua Basin agricultural operators, rural landowners, and the public of conservation issues and events.

Submit news articles and public service announcements to area newspapers, radio stations, and newsletters.
Invite media to conservation tours and workshops.
Include updates on the status of the Umpqua Basin AgWQM Area Plan and water quality data in Umpqua Basin SWCD, OSU Extension and watershed council newsletters.

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

4. Build partnerships with commodity groups to promote conservation.
Co-sponsor workshops and tours among the Umpqua Basin SWCDs, watershed councils, and commodity groups.
Share education materials with commodity groups and their representatives.

Develop educational materials in conjunction with commodity groups and watershed councils.
Partner with other agricultural and natural resource agencies, watershed councils, and commodity groups to access and acquire the material and financial resources to implement the Umpqua Basin AgWQM Area Plan and its educational component.
Meet with other agencies and organizations, and develop a strategy to obtain funding from traditional and nontraditional sources.

MONITORING

Monitoring of water quality in the Umpqua Basin is ongoing, intensive and extensive. Watershed assessment under the direction of the Partnership for the Umpqua Rivers is underway in several subbasins including Deer Creek and Cow Creek at this time, with additional subbasins scheduled. In addition, intensive temperature monitoring studies have been done on a number of streams in the basin, with follow-up studies continuing to provide comparison.

OSU Extension has trained a number of volunteer water quality monitors and a lab has been established at Umpqua Community College to facilitate testing. Landowners may request that testing be done by these volunteers. Agricultural landowners are also working with consultants associated with the Oregon Cattlemen's Association to obtain data on their stream reaches. Department of Environmental Quality is continuing their water quality testing to revise the 303(d) list as required by law, and their data is available.

All of the data from these monitoring efforts can be used to determine the areas of concern related to water quality, areas in good condition, and the effects of changes in management. Water quality monitoring can be done by landowners to assess their own situation. Help is available through OSU Extension, Oregon Cattlemen's Association, Partnership for the Umpqua Rivers, DEQ, and others. For guidelines to perform monitoring, the OWEB has developed Water Quality Monitoring: Technical Guide Book, July 1999. This is the recommended guide for conducting water monitoring in Oregon. The Oregon Department of Agriculture and Umpqua Basin LAC encourage landowners to get involved in water quality monitoring.

Appendix A - Coastal Zone Management Act

MEASURES

In 1990, the Federal Coastal Zone Reauthorization Amendments were enacted. This law mandated that all states and territories with approved coastal zone management programs develop and implement coastal nonpoint pollution control programs. Listed below are the Coastal Zone Management measures that were developed for use in Oregon for coastal basins such as the Umpqua.

The following section contains the approved management measures for coastal nonpoint pollution in Oregon as developed for the Coastal Zone Reauthorization Amendments.

Sedimentation

Apply the erosion component of a Resource Management System as defined in the Field Office Technical Guide of the U.S. Department of Agriculture, Natural Resources Conservation Service to minimize the delivery of sediment to surface waters.
Design and install a combination of management and physical practices to settle the settleable solids and associated pollutants in runoff delivered from the contributing area for storms of up to and including a 10-year, 24-hour frequency.

Nutrients

Develop, implement, and periodically update a nutrient management plan to: (1) apply nutrients at rates necessary to achieve realistic crop yields, (2) improve the timing of nutrient application, and (3) use agronomic crop production technology to increase nutrient use efficiency. When the source of the nutrients is other than commercial fertilizer, determine the nutrient value and the rate of availability of the nutrients. Determine and credit the nitrogen contribution of any legume crop. Soil and plant tissue testing should be used routinely.

Pesticides

Evaluate the pest problems, previous pest management practices, and cropping history.
Evaluate the soil and physical characteristics of the site, including mixing, loading and storage areas for potential of leaching or runoff of pesticides. If leaching or runoff is found, steps should be taken to prevent further contamination
Use integrated pest management (IPM) strategies that:
Apply pesticides only when an economic benefit to the producer will be achieved (i.e. application based on economic thresholds).
Apply pesticides efficiently and at times when runoff losses are unlikely.
When pesticide applications are necessary and a choice of registered materials exists,
consider the persistence, toxicity, runoff potential, and leaching potential of products being used.
Periodically calibrate pesticide spraying equipment.
Use anti-backflow devices on hoses used for filling tank mixtures.

Riparian Areas

Exclude livestock from riparian areas that are susceptible to overgrazing and when there is no other practical way to protect the riparian area when grazing uplands.
Provide stream crossings and hardened access areas for watering.
Provide alternative drinking water locations.
Locate salt and shade away from sensitive riparian locations.
Include riparian areas in separate pastures with separate management objectives and strategies.

Fence, or where appropriate, herd livestock out of areas for as long as necessary to allow vegetation and streambanks to recover.
Control the timing of grazing to: (1) keep livestock off streambanks where they are most vulnerable to damage, and (2) coincide with the physiological needs of target plant species.

Irrigation

Operate the irrigation system so that the timing and amount of water match crop water needs. This will require, at a minimum: (a) the accurate measure of soil water depletion and the volume of irrigation applied, and (b) uniform application of water.
When chemigation is used, include backflow preventers for wells, minimize the harmful amounts of chemigated waters from the field, and control deep percolation.
In cases where chemigation is performed with furrow irrigation systems, a tailwater management system may be needed.
In some locations, irrigation return flows are subject to other water rights or are required to maintain stream flow(s). In these special cases, on-site use could be precluded and would not be considered part of the management measures for such locations.
In some locations, leaching is necessary to control salt in the soil profile. Leaching for salt control should be limited to the leaching requirement for the root zone.
Where leakage from delivery systems or return flows support wetlands or wildlife refuges, it may be preferable to modify the system to achieve a high level of efficiency and then divert the “saved water” to the wetland or wildlife refuge. This will improve the quality of water delivered to wetlands or wildlife refuges by preventing the introduction of pollutants from irrigated lands to such diverted water.
In some locations, sprinkler irrigation is used for frost or freeze protection, or for crop cooling. In these special cases, applications should be limited to the amount necessary for crop protection, and applied water should remain on site.

Appendix B - Technical and Financial Resources for Landowners in the Umpqua Watershed

Bureau of Land Management
777 N.W. Garden Valley Blvd.
Roseburg, OR 97470
541. 440. 4930

Douglas County Water Resources Advisory Board
1036 S.E. Douglas
Roseburg, OR 97470
541. 957.5061

Douglas Soil and Water Conservation District
1443 NE Vine St.
Roseburg, OR 97470
541. 951.5061

Douglas Timber Operators
3000 N.W. Stewart Parkway
Roseburg, OR 97470
541. 672. 0757

Farm Services Agency (CREP Programs)
251 N.E. Garden Valley Blvd.
Roseburg, OR 97470
541. 673. 8316

Oregon Watershed Enhancement Board
101 N.W. “A” Street
Grants Pass, OR 97526
541. 474. 5385

National Marine Fisheries Service
2900 N.W. Stewart Parkway
Roseburg, OR 97470
541. 957. 3383

Natural Resources Conservation Service
251 N.E. Garden Valley Blvd.
Roseburg, OR 97470
541. 673. 8316

Oregon Department of Environmental Quality
725 S.E. Main Street
Roseburg, OR 97470
541. 440.3338 ext. 224

Oregon Department of Environmental Quality (Coastal Zone Management)
1102 Lincoln, Suite 210
Eugene, OR 97401
541. 686. 7838

Oregon Department of Fish and Wildlife
4192 N. Umpqua Highway
Roseburg, OR 97470
541. 440.3353

Oregon Department of Forestry
1758 N.E. Airport Road
Roseburg, OR 97470
541. 440.3412
Oregon State University Extension Service
Douglas County Office
1134 S.E. Douglas Avenue
Roseburg OR 97470
541. 672.4461

Southwest Resource Conservation and Development Council
576 NE "E" Street
Grants Pass OR 97526
541. 476. 5906

Partnership for the Umpqua Rivers
(formerly Umpqua Basin Watershed Council)
1758 N.E. Airport Road
Roseburg, OR 97470
541. 673. 5756

U.S. Department of Fish and Wildlife
2900 N.W. Stewart Parkway
Roseburg, OR 97470
541. 957. 3470

U.S. Forest Service
2900 N.W. Stewart Parkway
Roseburg, OR 97470
541. 957. 3204

Umpqua Regional Council of Governments
1036 S.E. Douglas
Roseburg, OR 97470
541. 440. 4231

Umpqua Soil and Water Conservation District
392 Fir Avenue Suite 104
Reedsport, OR 97467
541. 271. 2611

Umpqua Basin Agricultural Water Quality Management Administrative Rules

603-095-0700

Purpose

(1) These rules have been developed to implement a water quality management area plan for the Umpqua Basin Agricultural Water Quality Management Area pursuant to authorities vested in the department through ORS 568.900-568.933 and ORS 561.190 - 561.191, due to a determination by the Environmental Quality Commission to establish Total Maximum Daily Loads and allocate a load to agricultural nonpoint sources. The area plan is known as the Umpqua Basin Agricultural Water Quality Management Area Plan. After adoption of the TMDLs, these rules will be reviewed and modified as needed to provide reasonable assurance that the load allocations for agriculture will be met. Nothing in the Umpqua Basin Agricultural Water Quality Management Area Plan or rules adopted by the department will allow the department to implement this plan or rules in a manner that is in violation of the U. S. Constitution, the Oregon Constitution or other applicable state laws.

(2) It is intended that the Umpqua Basin Agricultural Water Quality Management Area Plan will aid in achieving compliance with these rules through education and promotion of voluntary land management measures.

(3) Failure to comply with any provisions of the Umpqua Basin Agricultural Water Quality Management Area Plan:

(a) does not constitute a violation of OAR 603-090-0000 to 603-090-0120, or of OAR 603-095-0010 to OAR 603-095-0760;

(b) is not intended by the Department to be evidence of a violation of any federal, state, or local law by any person.

(4) Nothing in the Umpqua Basin Agricultural Water Quality Management Area Plan shall be used to interpret any requirement of OAR 603-095-0010 to OAR 603-095-0760

Statutory Authority: ORS 561.190-561.191, 568.909

Stats. Implemented: ORS 568.900 - 568.933

603-095-0720

Geographic and Programmatic Scope

(1) The Umpqua Basin includes the drainage area for the South Umpqua, the North Umpqua, the mainstem Umpqua and the Smith River. The physical boundaries of the Umpqua basin are indicated on the map included as Appendix 1 of these rules.

(2) Operational boundaries for the land base under the purview of these rules include all lands within the Umpqua Basin in agricultural use and agricultural and rural lands which are lying idle or on which management has been deferred, with the exception of public lands managed by federal agencies (BLM, USFS and USFWS), and activities which are subject to the Forest Practices Act.

(3) Current productive agricultural use is not required for the provisions of these rules to apply. For example, highly erodible lands with no present active use are within the purview of these rules.

(4) The provisions and requirements outlined in these rules may be adopted by reference by Designated Management Agencies with appropriate authority and responsibilities in other geographic areas of the Umpqua Basin.

(5) For lands in agricultural use within other Designated Management Agencies' or state agency jurisdictions, the department and the appropriate Local Management Agency shall work with these Designated Management Agencies to assure that provisions of these rules apply, and to assure that duplication of any services provided or fees assessed does not occur.

Statutory Authority: ORS 561.190-561.191, 568.909, and 568.927

Stats. Implemented: ORS 568.900 - 568.933

603-095-0740

Conditions

(1) All landowners or occupiers conducting activities on lands in agricultural use shall be in compliance with the following criteria. A Landowner is responsible for only those conditions caused by agricultural activities conducted by the landowner. A landowner is not responsible for unacceptable conditions resulting from the actions of another landowner or occupier. Conditions resulting from unusual weather events or other exceptional circumstances are not the responsibility of the landowner.

(2) Unless otherwise noted, these rules are effective one year after adoption.

(3) Substantial amounts of sediment (i.e., in excess of water quality standards for sedimentation) moving from agricultural lands into waters of the state as a result of agricultural activities is identified as an unacceptable condition. Offstream ponds which do not contribute to the downstream system under normal weather conditions are exempt as they are often used to trap and contain sediment.

(4) Substantial amounts of phosphorus (i.e. in excess of water quality standards) moving from agricultural lands into waters of the state as a result of agricultural activities is identified as an unacceptable condition.

(5) Substantial amounts of bacteria (i.e. in excess of water quality standards) moving from agricultural lands into waters of the state as a result of agricultural activities is identified as an unacceptable condition.

(6) Agricultural management or soil-disturbing activities that preclude establishment and development of adequate riparian vegetation for streambank stability and shading, consistent with site capability, along a perennial stream which has a site potential for such vegetation is considered an unacceptable condition. Minimal breaks in shade vegetation for essential management activities are considered appropriate.

(7) Irrigation practices that contribute significant amounts of warmed surface water (more than 3% of water pumped during any one irrigation setting to return as surface runoff to a stream) back into a stream are considered an unacceptable condition.

(8) Effective upon adoption, no person subject to these rules shall violate any provision of ORS 468B.025 or ORS 468B.050.

603-095-0760

Complaints and Investigations

(1) When the department receives notice of an apparent occurrence of agricultural pollution through a written complaint, its own observation, through notification by another agency, or by other means, the department may conduct an investigation. The department may, at its discretion, coordinate inspection activities with the appropriate Local Management Agency.

(2) Each notice of an alleged occurrence of agricultural pollution will be evaluated in accordance with the criteria in ORS 568.900 to 568.933 or any rules adopted thereunder to determine whether an investigation is warranted.

(3) Any person allegedly being damaged or otherwise adversely affected by agricultural pollution or alleging any violation of ORS 568.900 to 568.933 or any rules adopted thereunder may file a complain with the department.

(4) The department will evaluate or investigate a complaint filed by a person under section OAR 603-095-0760(3) if the complaint is in writing, signed and dated by the complainant and indicates the location and description of:

(a) the waters of the state allegedly being damaged or impacted; and
the property allegedly being managed under conditions violating criteria described in

ORS 568.900 to 568.933 or any rules adopted thereunder.

(5) As used in section OAR 603-095-0760(4), “person” does not include any local, state or federal agency.

(6) Notwithstanding OAR 603-095-0760, the department may investigate at any time any complaint if the department determines that the violation alleged in the complain t may present an immediate threat to the public health or safety.

(7) If the department determines that a violation of ORS 568.900 to 568.033 or any rules adopted thereunder has occurred, the landowners may be subject to the enforcement procedures of the department outlines in OAR 603-090-0060 through 603-090-0120.

Statutory Authority: ORS 568.915, 568.918, and 568.933.

Statues Implemented: ORS 568.900 – 568.933

WQMP ATTACHMENT B - DEPARTMENT OF FORESTRY

Implementation Plan for

Non-Federal Forest Lands

Non-Federal Forest Lands

The purpose and goals of Oregon's Water Protection Rules (OAR 629-635-100) include protecting, maintaining, and improving the functions and values of streams, lakes, wetlands, and riparian management areas. Best management practices (BMPs) in the Oregon Forest Practices Act (FPA), including riparian zone protection measures and a host of other measures described below, are the mechanism for meeting State Water Quality Standards (WQS). There is a substantial body of scientific research and monitoring that supports an underlying assumption of the FPA, that maintaining riparian processes and functions is critical for water quality and fish and wildlife habitat. These riparian processes and functions include: Shade for stream temperature and for riparian species; large wood delivery to streams and riparian areas; leaf and other organic matter inputs; riparian microclimate regulation; sediment trapping; soil moisture and temperature maintenance; providing aquatic and riparian species dependent habitat; and nutrient and mineral cycling. The FPA provides a broad array of water quality benefits and contributes to meeting water quality standards for water quality parameters such as temperature, sediment, dissolved oxygen, nutrients, and aquatic habitat.

Currently, many streams within the Umpqua Subbasins significantly exceed the WQS for temperature. The water quality impairment(s) in the Umpqua Subbasins clearly do not result solely from current forestry activities. The proposed Umpqua Subbasins total maximum daily load (TMDL) demonstrates that urban and agriculture areas contribute significantly to water quality impairment within the subbasin. It is also important to note that historic forest practices such as splash dam activities and the widespread removal of wood from streams may continue to influence current stream conditions and riparian functions. In addition, current forest practices occur on forestlands that simultaneously support non-forestry land uses that can affect water quality, such as grazing, recreation, and public access roads. With this noted, the TMDL demonstrates that increasing the level of riparian vegetation retained along forested reaches of these streams reduces solar loading, potentially preventing a substantial amount of stream heating. While providing high levels of shade to streams is an important aspect of meeting instream temperature standards it needs to be considered within the context of past management, stream morphology and flows, groundwater influences, site-productivity, insects, fire, and other disturbance mechanisms that vary in time and space across the landscape.

As described below, ODF and DEQ are involved in several statewide efforts to analyze the existing FPA measures and to better define the relationship between the TMDL load allocations and the FPA measures designed to protect water quality. The information in the TMDL, as well as other monitoring data, will be an important part of the body of information used in determining the adequacy of the FPA.

Forest practices on non-federal land in Oregon are regulated under the FPA and implemented through administrative rules that are administered by the Oregon Department of Forestry (ODF). The Oregon Board of Forestry (BOF), in consultation with the Environmental Quality Commission (EQC), establish BMPs and other rules to ensure that, to the extent practicable, NPS pollution resulting from forest operations does not impair the attainment of water quality standards. With respect to the temperature standard, surface water temperature management plans are required according to OAR 340-041-0026 when temperature criteria are exceeded and the waterbody is designated as water-quality limited under Section 303(d) of the Clean Water Act. In the case of state and private forestlands, OAR 340-041-0120 identifies the FPA rules as the surface water management plan for forestry activities

ODF and DEQ statutes and rules also include provisions for adaptive management that provide for revisions to FPA practices where necessary to meet water quality standards. These provisions are described in ORS 527.710, ORS 527.765, ORS 183.310, OAR 340-041-0026, OAR 629-635-110, and OAR 340-041-0120. Current adaptive management efforts under several of the above statutes and rules are described in more detail following the discussion below on the roles of the BOF and EQC in developing BMPs that will achieve water quality standards.

ORS 527.765: Best Management Practices to Maintain Water Quality

(1) The State Board of Forestry shall establish best management practices and other rules applying to forest practices as necessary to insure that to the maximum extent practicable nonpoint source discharges of pollutants resulting from forest operations on forestlands do not impair the achievement and maintenance of water quality standards established by the Environmental Quality Commission for the waters of the state. Such best management practices shall consist of forest practices rules adopted to

prevent or reduce pollution of waters of the state. Factors to be considered by the board in establishing best management practices shall include, where applicable, but not be limited to:
(a) Beneficial uses of waters potentially impacted;
(b) The effects of past forest practices on beneficial uses of water;
(c) Appropriate practices employed by other forest managers;
(d) Technical, economic and institutional feasibility; and
(e) Natural variations in geomorphology and hydrology.

ORS 527.770: Good Faith Compliance with Best Management Practices Not Violation of Water Quality Standards; Subsequent Enforcement of Standards.
A forest operator conducting, or in good faith proposing to conduct, operations in accordance with best management practices currently in effect shall not be considered in violation of any water quality standards. When the State Board of Forestry adopts new best management practices and other rules applying to forest operations, such rules shall apply to all current or proposed forest operations upon their effective dates.

There are currently extensive statutes and administrative rules that regulate forest management activities in the Grande Ronde basin that address the key water quality issues of stream temperatures, riparian aquatic functions, and sediment dynamics. The following is a list of specific administrative rules describing the purpose and goals of the FPA towards the achievement and maintenance of water quality standards established by the EQC.

OAR 629-635-100 - Water Protection Rules; Purpose and Goals
(3) The purpose of the water protection rules is to protect, maintain and, where appropriate, improve the functions and values of streams, lakes, wetlands, and riparian management areas. These functions and values include water quality, hydrologic functions, the growing and harvesting of trees, and fish and wildlife resources.
(4) The water protection rules include general vegetation retention prescriptions for streams, lakes and wetlands that apply where current vegetation conditions within the riparian management area have or are likely to develop characteristics of mature forest stands in a "timely manner." Landowners are encouraged to manage stands within riparian management areas in order to grow trees in excess of what must be retained so that the excess may be harvested.
(5) The water protection rules also include alternative vegetation retention prescriptions for streams to allow incentives for operators to actively manage vegetation where existing vegetation conditions are not likely to develop characteristics of mature conifer forest stands in a "timely manner."
(6) OARs 629-640-400 and 629-645-020 allow an operator to propose site-specific prescriptions for sites where specific evaluation of vegetation within a riparian management area and/or the condition of the water of the state is used to identify the appropriate practices for achieving the vegetation and protection goals.
(7) The overall goal of the water protection rules is to provide resource protection during operations adjacent to and within streams, lakes, wetlands and riparian management areas so that, while continuing to grow and harvest trees, the protection goals for fish, wildlife, and water quality are met.
(a) The protection goal for water quality (as prescribed in ORS 527.765) is to ensure through the described forest practices that, to the maximum extent practicable, non-point source discharges of pollutants resulting from forest operations do not impair the achievement and maintenance of the water quality standards.
(b) The protection goal for fish is to establish and retain vegetation consistent with the vegetation retention objectives described in OAR 629-640-000 (streams), OAR 629-645-000 (significant wetlands), and OAR 629-650-000 (lakes) that will maintain water quality and provide aquatic habitat components and functions such as shade, large woody debris, and nutrients.

OAR 629-640-000 - Vegetation Retention Goals for Streams; Desired Future Conditions
(1) The purpose of this rule is to describe how the vegetation retention measures for streams were determined, their purpose and how the measures are implemented. The vegetation retention requirements for streams described in OAR 629-640-100 through OAR 629-640-400 are designed to produced desired future conditions for the wide range of stand types, channel conditions, and disturbance regimes that exist throughout forestlands in Oregon.

(2) The desired future condition for streamside areas along fish use streams is to grow and retain vegetation so that, over time, average conditions across the landscape become similar to those of mature streamside stands. Oregon has a tremendous diversity of forest tree species growing along waters of the state and the age of mature streamside stands varies by species. Mature streamside stands are often dominated by conifer trees. For many conifer stands, mature stands occur between 80 and 200 years of stand age. Hardwood stands and some conifer stands may become mature at an earlier age. Mature stands provide ample shade over the channel, an abundance of large woody debris in the channel, channel-influencing root masses along the edge of the high water level, snags, and regular inputs of nutrients through litter fall.

(3) The rule standards for desired future conditions for fish use streams were developed by estimating the conifer basal area for average unmanaged mature streamside stands (at age 120) for each geographic region. This was done by using normal conifer yield tables for the average upland stand in the geographic region, and then adjusting the basal area for the effects of riparian influences on stocking, growth and mortality or by using available streamside stand data for mature stands.

(4) The desired future condition for streamside areas that do not have fish use is to have sufficient streamside vegetation to support the functions and processes that are important to downstream fish use waters and domestic water use and to supplement wildlife habitat across the landscape. Such functions and processes include: maintenance of cool water temperature and other water quality parameters; influences on sediment production and bank stability; additions of nutrients and large conifer organic debris; and provision of snags, cover, and trees for wildlife.

(5) The rule standards for desired future conditions for streams that do not have fish use were developed in a manner similar to fish use streams. In calculating the rule standards, other factors used in developing the desired future condition for large streams without fish use and all medium and small streams included the effects of trees regenerated in the riparian management area during the next rotation and desired levels of instream large woody debris.

(6) For streamside areas where the native tree community would be conifer dominated stands, mature streamside conditions are achieved by retaining a sufficient amount of conifers next to large and medium sized fish use streams at the time of harvest, so that halfway through the next rotation or period between harvest entries, the conifer basal area and density is similar to mature unmanaged conifer stands. In calculating the rule standards, a rotation age of 50 years was assumed for even-aged management and a period between entries of 25 years was assumed for uneven-aged management. The long-term maintenance of streamside conifer stands is likely to require incentives to landowners to manage streamside areas so that conifer reforestation occurs to replace older conifers over time.

(7) Conifer basal area and density targets to produce mature stand conditions over time are outlined in the general vegetation retention prescriptions. In order to ensure compliance with state water quality standards, these rules include requirements to retain all trees within 20 feet and understory vegetation within 10 feet of the high water level of specified channels to provide shade.

(8) For streamside areas where the native tree community would be hardwood dominated stands, mature streamside conditions are achieved by retaining sufficient hardwood trees. As early successional species, the long-term maintenance of hardwood streamside stands will in some cases require managed harvest using site specific vegetation retention prescriptions so that reforestation occurs to replace older trees. In order to ensure compliance with state water quality standards, these rules include requirements in the general vegetation retention prescription to retain all trees within 20 feet and understory vegetation within 10 feet of the high water level of specified channels to provide shade.

(9) In many cases the desired future condition for streams can be achieved by applying the general vegetation retention prescriptions, as described in OAR 629-640-100 and OAR 629-640-200. In other cases, the existing streamside vegetation may be incapable of developing into the future desired conditions in a "timely manner." In this case, the operator can apply an alternative vegetation retention prescription described in OAR 629-640-300 or develop a site specific vegetation retention prescription described in OAR 629-640-400. For the purposes of the water protection rules, "in a timely manner" means that the trees within the riparian management area will meet or exceed the applicable basal area

target or vegetation retention goal during the period of the next harvest entry that would be normal for the site. This will be 50 years for many sites.

(10) Where the native tree community would be conifer dominant stands, but due to historical events the stand has become dominated by hardwoods, in particular, red alder, disturbance is allowed to produce conditions suitable for the re-establishment of conifer. In this and other situations where the existing streamside vegetation is incapable of developing characteristics of a mature streamside stand in a "timely manner," the desired action is to manipulate the streamside area and woody debris levels at the time of harvest (through an alternative vegetation retention prescription or site specific vegetation retention prescription) to attain such characteristics more quickly.

The Water Protection Rules are an important component of the rules that are designed to achieve and maintain water quality standards. The rules identify seven geographic regions and distinguishes between streams, lakes, and wetlands. The rules further distinguish each stream by size and type. Stream size is distinguished as small, medium, or large, based on average annual flow. Stream type is distinguished as fish use, domestic use, or neither.

Generally, no tree harvesting is allowed within 20 feet of all fish bearing, all domestic-use, and all other medium and large streams unless stand restoration is needed. In addition, all snags and downed wood must be retained in every riparian management area. Provisions governing vegetation retention are designed to encourage conifer restoration on riparian forestland that is not currently in the desired conifer condition. Future supplies of conifer on these sites are deemed desirable to support stream functions and to provide fish and wildlife habitat. The rules provide incentives for landowners to place large wood in streams to immediately enhance fish habitat. Other alternatives are provided to address site-specific conditions and large-scale catastrophic events.

The goal for managing riparian forests along fish-use streams is to grow and retain vegetation so that, over time, average conditions across the riparian landscape become similar to those of mature unmanaged riparian stands. This goal is based on the following considerations:

(1) Mature riparian stands can supply large, persistent woody debris necessary to maintain adequate fish habitat. A shortage of large wood currently exists in streams on non-federal forestlands due to historic practices and a wide distribution of young, second growth forests. For most streams, mature riparian stands are able to provide more of the functions and inputs of large wood than are provided by young second-growth trees.

(2) Historically, riparian forests were periodically disturbed by wildfire, windstorms, floods, and disease. These forests were also impacted by wildlife such as beaver, deer, and elk. These disturbances maintained a forest landscape comprised of riparian stands of all ages ranging from early successional to old growth. At any given time, however, it is likely that a significant proportion of the riparian areas supported forests of mature age classes. This distribution of mature riparian forests supported a supply of large, persistent woody debris that was important in maintaining quality fish habitat.

The overall goals of the riparian vegetation retention rules along Type N and Type D streams are the following:

Grow and retain vegetation sufficient to support the functions and processes that are important to downstream waters that have fish;
Maintain the quality of domestic water; and
Supplement wildlife habitat across the landscape.

These streams have reduced riparian management area (RMA) widths and reduced basal area retention requirements as compared to similar sized Type F streams (Table 1). In the design of the rules this was judged appropriate based on a few assumptions. First, it was assumed that the amount of large wood entering Type N and D channels over time was not as important for maintaining fish populations within a given stream reach. And second, it was assumed that the future stand could provide some level of “functional” wood over time in terms of nutrient inputs and sediment storage. The validity of these assumptions needs to be evaluated over time through monitoring.

Table 1. Riparian Management Area widths for streams of various sizes and beneficial uses (OAR 629-635-310).

	Type F	Type D	Type N
LARGE	100 feet	70 feet	70 feet
MEDIUM	70 feet	50 feet	50 feet
SMALL	50 feet	20 feet	Apply specified water quality protection measures, and see OAR 629-640-200

For all streams that require an RMA, basal area targets are established that are used for any type of management within the RMA. These targets were determined based on the data that was available at the time, with the expectation that these targets could be achieved on the ground. There is also a minimum tree number requirement of 40 trees per 1000 feet along large streams (11-inch minimum diameter at breast height), and 30 trees per 1000 feet along medium streams (8-inch minimum diameter at breast height). The specific levels of large wood inputs that the rules are designed to achieve are based on the stream size and type. The biological and physical characteristics specific to a given stream are taken into account in determining the quantity and quality of large wood that is functional for that stream. Given the potential large wood that is functional for a given stream, a combination of basal area targets, minimum tree retention, buffer widths, and future regenerated stands and ingrowth are used to achieve the appropriate large wood inputs and effective shade for a given stream.

The expectation is that these vegetation retention standards will be sufficient towards maintaining stream temperatures that are within the range of natural variability. In the design of the Water Protection Rules shade data was gathered for 40 small non-fish-bearing streams to determine the shade recovery rates after harvesting. One to two years after harvest, 55 percent of these streams were at or above pre-harvest shade levels due to understory vegetation regrowth. Most of these streams had a bankfull width averaging less than six feet, and most shade was provided by shrubs and grasses within 10 feet of the bank. Since 1991 there has also been a 120-acre limit on a single clearcut size, which is likely to result in a scattering of harvested area across a watershed over time. In the development of the rules it was assumed that this combined with the relative rapid shade recovery along smaller non-fish-bearing streams would be adequate in protecting stream temperatures and reduce possible cumulative effects. For fish bearing streams it is assumed that a 20-foot no-harvest buffer, combined with the tree retention requirements for the rest of the RMA, will be adequate to maintain shade levels necessary to achieve stream temperature standards. The monitoring program is currently collecting data to test these assumptions, evaluate the effectiveness of the rules, and evaluate whether or not water quality standards for temperature are being achieved.

In terms of sediment issues specific to forest roads, there are BMPs within the FPA specifically designed to regulate road design, construction and maintenance. The bulk of the BMPs are directed at minimizing sediment delivery to channels. The primary goals of the road rules are to: (1) protect the water quality of streams, lakes, and wetlands; (2) protect fish and wildlife habitat; and (3) protect forest productivity.

The Board of Forestry revised several BMPs related to road design when the new Water Protection Rules were adopted in the fall of 1994. Significant changes made to the road construction rules include the following:

The requirement for operators not to locate roads in riparian management areas, flood plains, or wetlands unless all alternative locations would result in greater resource damage.
The requirement for operators to design stream crossings to both minimize fill size and minimize excavation of slopes near the channel. A mandatory written plan is required for stream crossing fills over 15 feet deep.
The requirement to design stream crossing structures for the 50-year flow with no ponding, rather than the 25-year storm with no specification of allowable ponding.
The requirement that stream crossing structures be passable by juvenile fish as well as adult fish.
The requirement that fish must be able to access side channels.

The requirement that stream structures constructed under these rules must be maintained for fish passage.

In determining the location of a new road, operators are required to avoid steep slopes, slides and areas next to channels or in wetlands to the extent possible. Existing roads should be used when possible, and stream crossings should be used only when essential. The design of the road grade must vary to fit the local terrain and the road width must be minimized. The operator must also follow specific guidelines for stream-crossing structures (listed above). Cross-drainage structures must be designed to divert water away from channels so that runoff intercepted by the road is dispersed onto the hillslope before reaching a channel. The specific method used is up to the operator, but the end result should be the dispersal of water running off of the road and the filtering of fine sediment before the water reaches waters of the state.

Construction and maintenance activities should be done during low water periods and when soils are relatively dry. Excavated materials must be placed where there is minimal risk of those materials entering waters of the state, and erodible surfaces must be stabilized. Landings must be built away from streams, wetlands and steep slopes.

Road maintenance is required on all active and inactive roads. Regardless of when a road was constructed, if the road has been used as part of an active operation after 1972, it is subject to all maintenance requirements within the current rules. Culverts must be kept open, and surface road drainage and adequate filtering of fine sediment must be maintained. If the road surface becomes unstable or if there is a significant risk of sediment running off of the road surface and entering the stream, road activity must be halted and the erodible area must be stabilized. Abandoned roads constructed prior to 1972 and not used for forest management since that time are not subject to Forest Practices regulatory authority.

All roads in use since 1972 must either be maintained or vacated by the operator. Vacated roads must be effectively barricaded and self-maintaining, in terms of diverting water away from streams and off of the former road surface, where erosion will remain unlikely. Methods for vacating roads include pulling stream-crossing fills, pulling steep side cast fills, and cross ditching. It is up to the landowner to choose between vacating a road and maintaining a road. If a road is not vacated, the operator is required to maintain the road under the current rules whether it is active or inactive, however they are not required to bring the design up to current standards outside of the normal maintenance and repair schedule.

The ODF has a monitoring program that is currently coordinating separate projects to monitor the effectiveness of the forest practice rules with regard to landslides, riparian function, stream temperature, chemical applications, sediment from roads, BMP compliance, and shade. The results from some of these projects have been released in the form of final reports and other projects will have final reports available in the spring of 2000, 2001 and beyond.

Voluntary measures are currently being implemented across the state under the Oregon Plan for Salmon and Watersheds (OPSW) to address water quality protection. These measures are designed to supplement the conifer stocking within riparian areas, increase large wood inputs to streams, and provide for additional shade. This is accomplished during harvest operations by (1) placing appropriate sized large wood within streams that meet parameters of gradient, width and existing wood in the channel; and (2) relocating in-unit leave trees in priority areas[1] to maximize their benefit to salmonids while recognizing operational constraints, other wildlife needs, and specific landowner concerns.

The measures include the following:

ODF 8S: Riparian Conifer Restoration
Forest practice rules have been developed to allow and provide incentives for the restoration of conifer forests along hardwood-dominated RMAs where conifers historically were present. This process enables sites capable of growing conifers to contribute conifer LWD in a timelier manner. This process will be

[1] The Executive Order replaced the concept of “core areas” with “priority areas”. See (1)(f) of the Executive Order (p.5).

modified to require an additional review process before the implementation of conifer restoration within core areas.

ODF 19S: Additional Conifer Retention along Fish-Bearing Streams in Core Areas
This measure retains more conifers in RMAs by limiting harvest activities to 25 percent of the conifer basal area above the standard target. This measure is only applied to RMAs containing a conifer basal area that is greater than the standard target.

ODF 20S: Limited RMA for Small Type N Streams in Core Areas
This measure provides limited 20 foot RMAs along all perennial or intermittent small Type N streams for the purpose of retaining snags and downed wood.

ODF 21S: Active Placement of Large Wood During Forest Operations
This measure provides a more aggressive and comprehensive program for placing large wood in streams currently deficient of large wood. Placement of large wood is accomplished following existing ODF/ODFW placement guidelines and determining the need for large wood placement is based upon a site-specific stream survey.

ODF 22S: 25 Percent In-unit Leave Tree Placement and Additional Voluntary Retention
This measure has one non-voluntary component and two voluntary components:
The State Forester, under statutory authority, will direct operators to place 25 percent of in-unit leave trees in or adjacent to riparian management areas on Type F and D streams.
The operator voluntarily locates the additional 75 percent in-unit leave trees along Type N, D or F streams, and
The State Forester requests the conifer component be increased to 75 percent from 50 percent.

ODF 61S: Analysis of "Rack" Concept for Debris Flows
OFIC members will conduct surveys to determine the feasibility and value of retaining trees along small type N streams with a high probability of debris flow in a "rack" just above the confluence with a Type F stream. The rack would extend from the RMA along the Type F stream up the Type N stream some distance for the purpose of retaining trees that have a high likelihood of delivery to the Type F stream.

ODF 62S: Voluntary No-Harvest Riparian Management Areas
Establishes a system to report and track, on a site-specific basis, when landowners voluntarily take the opportunity to retain no-harvest RMAs.

The voluntary management measures are implemented within priority areas. Several of the measures utilize in-unit leave trees and are applied in a “menu” approach to the extent in-unit leave trees are available to maximize their value to the restoration of salmonid habitat. The choice of menu measures is at the discretion of the landowner, but one or more of the measures is selected.

The measures can be described as either active restoration measures, or passive restoration measures that provide long-term large wood recruitment. Voluntary measures ODF 8S and 21S are active restoration activities. ODF 8 restores hardwood-dominated riparian areas back to a conifer-dominated condition, where appropriate, using a site-specific plan. Site-specific plans require additional consultation with the ODFW to minimize potential damage to the resource. They often result in conditions that are more protective of the resources than would occur without the site-specific plan. ODF 21S addresses large wood placement if stream surveys determine there is a need. Measures ODF 19S, 20S, 22S, and 62S provide future large wood recruitment through additional riparian protection. This additional protection is accomplished by retaining in-unit leave trees, snags, and downed wood within and along RMAs, and by changing the ratio of in-unit leave trees to 75 percent conifer.

The following application priority has been developed for OPSW voluntary measures for harvest units containing more than one stream type. The list establishes the general priority for placement of in-unit leave trees.

Small and medium Type F streams.

Non-fish bearing streams (Type D or Type N), especially small low-order headwater stream channels, that may affect downstream water temperatures and the supply of large wood in priority area streams.

Streams identified as having a water temperature problem in the DEQ 303(d) list of water quality limited waterbodies, or as evidenced by other available water temperature data; especially reaches where the additional trees would increase the level of aquatic shade.
Potentially unstable slopes where slope failure could deliver large wood.
Large Type F streams, especially where low gradient, wide floodplains exist with multiple, braided meandering channels.
Significant wetlands and stream-associated wetlands, especially estuaries and beaver pond complexes, associated with a salmon core area stream.

The Oregon Plan also has voluntary measures addressing sediment issues related to forest roads. Many forest roads built prior to the development of the FPA or prior to the current BMPs continue to pose increased risk to fish habitat. Industrial forest landowners and state forest lands are currently implementing the Road Hazard Identification and Risk Reduction Project, measures ODF 1S and ODF 2S, to identify risks to salmon from roads and address those risks. The purposes of this project are:

Implement a systematic process to identify road-related risks to salmon and steelhead recovery.
Establish priorities for problem solution.
Implement actions to reduce road related risks.

The Road Hazard Identification and Risk Reduction Project is a major element of the Oregon Plan. The two major field elements of this project are (1) the surveying of roads using the Forest Road Hazard Inventory Protocol, and (2) the repairing of problem sites identified through the protocol. Road repairs conducted as a result of this project include improving fish passage, reducing washout potential, reducing landslide potential, and reducing the delivery of surface erosion to streams.

Roads assessed by this project include all roads on Oregon Forest Industry Council member forestland, plus some other industrial and non-industrial forestland, regardless of when they were constructed. Industrial forest landowners have estimated spending approximately $13 million a year, or $130 million over the next 10 years, on this project for the coastal ESUs alone. However, the effort is not limited to nor bound by this funding estimate. Funding for the implementation for this measure within the other ESUs will be reflective of road problems found.

Under ODF 2S, the State Forest Lands program has spent over $2.5 million during the last biennium (1997-1999) for the restoration of roads, replacement of culverts and other stream crossing structures damaged by the 1996 storm. State Forest Lands are also proposing to spend an additional $2.5 million dollars in each of the next two biennia to improve roads, including stream crossing structures. This effort will upgrade approximately 130 miles of road in each biennium.

In addition to ODF 1S & 2S, there are additional measures under the Oregon Plan that address road management concerns:

ODF 16S - Evaluation of the Adequacy of Fish Passage Criteria: Establish that the criteria and guidelines used for the design of stream crossing structures pass fish as intended under the goal.
ODF 34S - Improve Fish Passage BMPs on Stream Crossing Structures: Ensure that all new stream crossing structures on forestland installed or replaced after the fall of 1994 will pass both adult and juvenile fish upstream and down stream.

Adaptive Management Process
By statute, forest operators conducting operations in accordance with the BMPs are considered to be in compliance with Oregon's water quality standards. The 1994 Water Protection Rules were adopted with the approval of the Environmental Quality Commission as not violating water quality standards. However, there are several provisions within the FPA and rules that require adaptive management.

In January of 1999 the Governor of Oregon signed Executive Order no. EO 99-01 that directed the Oregon Board of Forestry, with the assistance of an advisory committee, to determine to what extent changes to forest practices are needed to meet state water quality standards and protect and restore salmonids. The committee was directed to consider both regulatory and non-regulatory approaches to water quality protection. To carry out this charge, an ad hoc advisory committee developed four separate issue papers on the following topics:

Fish passage restoration and water classification
Forest roads
Riparian functions
Landslides

The committee represented diverse interests, including environmental, industrial, non-industrial, county, and public advocates. In addition to ODF technical staff, the Oregon Department of Environmental Quality (DEQ) and Oregon Department of Fish and Wildlife (ODFW) technical staff participated in the process. The committee made its recommendations to the Board of Forestry in September 2000. The Board is now considering the recommendations in order to determine whether revisions to the FPA and additional voluntary approaches are necessary consistent with ORS 527.710 and ORS 527.714.

As the DMA for water quality management on nonfederal forestlands, the ODF has recently completed working with the ODEQ through a memorandum of understanding (MOU) signed in April of 1998. This MOU was designed to improve the coordination between the ODF and the ODEQ in evaluating and proposing possible changes to the forest practice rules as part of the Total Maximum Daily Load process. The purpose of the MOU was also to guide coordination between the ODF and ODEQ regarding water quality limited streams on the 303d list. An evaluation of rule adequacy has been conducted (also referred to as the "Sufficiency Analysis") through the analysis of water quality parameters that can potentially be affected by forest practices. This statewide demonstration of forest practices rule effectiveness in the protection of water quality addressed the following specific parameters:

Temperature
Sediment
Turbidity
Aquatic habitat modification
Bio-criteria

The Sufficiency Analysis final report has been externally reviewed by peers and other interested parties. The report was designed, in part, to provide background information and assessments of BMP effectiveness in meeting water quality standards. The report demonstrates overall FPA adequacy at the statewide scale with due consideration to regional and local variation in effects. Achieving the goals and objectives of the FPA will ensure the achievement and maintenance of water quality goals. The report offers recommendations to highlight general areas where current practices could be improved in order to better meet the FPA goals and objectives and in turn provide added assurance of meeting water quality standards. The Board of Forestry will consider these recommendations, along with the FPAC recommendations, in their on-going review of the FPA in order to determine whether revisions and/or additional voluntary approaches are necessary consistent with ORS 527.710 and ORS 527.714.

There may be circumstances unique to a watershed or information generated outside of the statewide sufficiency process that need to be considered to adequately evaluate the effectiveness of the BMPs in meeting water quality standards. Information from the TMDL, ad hoc committee process, ODF Water Protection Rule effectiveness monitoring program, and other relevant sources may address circumstances or issues not addressed by the statewide sufficiency process. This information will also be considered in making the FPA sufficiency determination.

The above adaptive management process may result in findings that indicate changes are needed to the current forest practice rules to protect water quality. Any rule making that occurs must comply with the standards articulated under ORS 527.714(5). This statute requires, among other things, that regulatory and non-regulatory alternatives have been considered and that the benefits provided by a new rule are in proportion to the degree that existing forest practices contribute to the overall resource concern.

WQMP ATTACHMENT C - ODOT IMPLEMENTATION PLAN

Entire plan can be viewed online on the ODOT website at:
http://www.odot.state.or.us/eshtm/images/4dman.pdf

The Oregon Department of Transportation (ODOT) plan addresses the requirements of a Total Maximum Daily Load (TMDL) allocation for pollutants associated with the ODOT system. This statewide approach for an ODOT TMDL watershed management plan would address specific pollutants, but not specific watersheds. Instead, this plan would demonstrate how ODOT incorporates water quality into project development, construction, and operations and maintenance of the state and federal transportation system, thereby meeting the elements of the National Pollutant Discharge Elimination System (NPDES) program, and the TMDL requirements.

ODOT has partnered with DEQ in the development of several watershed management plans. By presenting a single, statewide, management plan, ODOT:

- Streamlines the evaluation and approval process for the watershed management plans
- Provides consistency to the ODOT highway management practices in all TMDL watersheds.
- Eliminates duplicative paperwork and staff time developing and participating in the numerous TMDL management plans.

Temperature and sediment are the primary concerns for pollutants associated with ODOT systems that impair the waters of the state. DEQ is still in the process of developing the TMDL water bodies and determining pollutant levels that limit their beneficial uses. As TMDL allocations are established by watershed, rather than by pollutants, ODOT is aware that individual watersheds may have pollutants that may require additional consideration as part of the ODOT watershed management plan. When these circumstances arise, ODOT will work with DEQ to incorporate these concerns into the statewide plan.

ODOT Limitations

The primary mission of ODOT is to provide a safe and effective transportation system, while balancing the requirements of environmental laws. ODOT is a dedicated funding agency, restricted by the Oregon Constitution in its legal authority and use of resources in managing and operating the state and federal highway system. ODOT can only expend gas tax resources within the right of way for the operation, maintenance and construction of the highway system.

ODOT and DEQ recognize that the ODOT system has the potential to negatively impact the beneficial uses of the waters of the state, primarily through surface water runoff. However, removal of vegetative cover to provide for safety, and undermining of the road associated with bank failure may impact temperature and sediment allocations.

As defined in the TMDL program, ODOT is a Designated Management Agency (DMA) because highways have the potential to pollute waterways and negatively impact watershed health. With this definition of a DMA, ODOT is required to participate in developing and implementing watershed management plans that will reduce the daily pollutant loads generated from ODOT highways to acceptable TMDL levels.

ODOT is not a land use or natural resource management agency. ODOT has no legal authority or jurisdiction over lands, waterways, or natural resources that are located outside of its right of way. ODOT's contribution to the TMDL management plan can only be directed at the development, design, construction, operations and maintenance of the ODOT system.

Related Clean Water Regulations

There are various water quality laws and regulations that overlap with the TMDL program. In a TMDL Memorandum of Agreement with the Environmental Protection Agency (EPA) (July 2000), DEQ states that; "DEQ will implement point source TMDLs through the issuance or re-issuance of National Pollutant Discharge Elimination System (NPDES) permits". The DEQ NPDES municipal permit program was established in 1994 and requires owners and operators of public storm water systems to reduce or eliminate storm water pollutants to the maximum extent practicable.

On June 9, 2000, ODOT received an NPDES permit from DEQ that covers all new and existing discharges of storm water from the Municipal Separated Storm Sewer associated with the ODOT owned and maintained facilities and properties located within the highway right of way and maintenance facilities for all basins in Oregon. This permit required the development of a statewide ODOT storm water management plan.

Other environmental regulations that overlap with the intent of the TMDL program include the federal and state Endangered Species Act, Corps of Engineers Wetland 404 permit regulations, state cut and fill removal laws, erosion control regulations, ground water protection rules, etc. Many federal, state, and local agencies join DEQ in administering and enforcing these various environmental regulations related to water quality.

ODOT Programs

ODOT established a Clean Water program in 1994 that works to develop tools and processes that will minimize the potential negative impacts of activities associated with ODOT facilities on Oregon's water resources. The ODOT Clean Water program is based on developing and implementing Best Management Practices (BMPs) for construction and maintenance activities. ODOT has developed, or is developing the following documents, best management practices, or reviews, that reduce sediment and temperature impacts:

- **ODOT Routine Road Maintenance Water Quality and Habitat Guide, Best Management Practices, July 1999 (ESA 4(d) Rule)**

ODOT has worked with National Marine Fisheries Service (NMFS) and Oregon Department of Fish and Wildlife (ODFW) to develop Best Management Practices (BMPs) that minimize negative environmental impacts of routine road maintenance activities on fish habitat and water quality. The National Marine Fisheries Service has determined that routine road maintenance, performed under the above mentioned guide, does not constitute a 'take' of anadromous species listed under the federal Endangered Species Act, and therefore additional federal oversight is not required. This determination has been finalized as part of the Federal Register, Volume 65, Number 132, dated Monday, July 10, 2000, pages 42471-42472. In addition, the Oregon Department of Fish and Wildlife has determined that the guide, and BMPs are adequate to protect habitat during routine maintenance activities.

- **NPDES Municipal Separated Storm Sewer System (MS4) Permit**

ODOT worked with DEQ to develop a statewide NPDES MS4 permit and storm water management program that reduces pollutant loads in the ODOT storm water system. The permit was issued to ODOT on June 9, 2000.

- **NPDES 1200CA Permit**

ODOT has developed an extensive erosion control program that is implemented on all ODOT construction projects. The program addresses erosion and works to keep sediment loads in

surface waters to a minimum. ODOT currently holds 5 regional permits that cover highway construction.

- **Erosion and Sediment Control Manual**

ODOT Geotechnical/Hydraulic staff have developed erosion and sediment control manuals and training for construction and maintenance personnel. Included in the manual are designs for different types of erosion control measures.

- **National Environmental Policy Act (NEPA) Reviews**

ODOT is an agent of the Federal Highway Administration, consequently, ODOT must meet NEPA requirements during project development. Included in the project development process are reviews to avoid, minimize and mitigate project impacts to natural resources, including wetlands and waters of the state.

- **Integrated Vegetation Management (IVM) District Plans**

ODOT works with the Oregon Department of Agriculture and other agencies to develop activities that comply with regulations that pertain to the management of roadside vegetation. Vegetation management BMPs can directly effect watershed health. Each ODOT district develops an integrated vegetation management plan.

- **Forestry Program**

ODOT manages trees located within its right of way in compliance with the Oregon Forest Practices Act and other federal, state, and local regulations. Temperature, erosion, and land stability are watershed issues associated with this program. ODOT is currently working with ODFW on a prototype for managing hazardous trees along riparian corridors.

- **Cut/Fill Slope Failure Programmatic Biologic Assessment**

ODOT has been in formal consultation with the National Marine Fisheries Service, the US Fish and Wildlife Service and the Oregon Department of Fish and Wildlife Service in the development of a programmatic biological assessment for how ODOT will repair cut/fill slope failures in riparian corridors. The draft document outlines best management practices to be used in stabilizing failed stream banks, and bio-engineered design solutions for the failed banks.

- **Disposal Site Research Documentation and Programmatic Biological Assessment**

ODOT has been working with DEQ in researching alternatives and impacts associated with the disposal of materials generated from the construction, operation and maintenance of the ODOT system. ODOT has begun the process of entering into formal consultation with NMFS, USFWS, and ODFW on disposing of clean fill material.

ODOT TMDL Pollutants

ODOT and DEQ have identified temperature and sediment as the primary TMDL pollutants of concern associated with highways. While DEQ may identify other TMDL pollutants within the watershed, many historical pollutants, or pollutants not associated with ODOT activities, are outside the control or responsibility of ODOT. In some circumstances, such as historical pollutants within the right of way, it is expected that ODOT will control these pollutants through the best management practices associated with

sediment control. ODOT is expecting that by controlling sediment load these TMDL pollutants will be controlled. Research has indicated that controlling sediment also controls heavy metals, oils and grease, and other pollutants.

Oregon's limited summer rainfall makes it highly unlikely that ODOT storm water discharges elevate watershed temperatures. Management of roadside vegetation adjacent to waterways can directly effect water temperature. ODOT has begun to incorporate temperature concerns into its vegetation management programs and project development process.

Other TMDL concerns, such as dissolved oxygen, or chlorophyll A, can be associated with increased temperature. These TMDLs are not associated with the operation and maintenance of the transportation system, and are outside the authority of ODOT. Specific TMDL concerns that are directly related to the transportation system will be incorporated into the ODOT management plan.

ODOT NPDES characterization monitoring indicates ODOT pollutant levels associated with surface water runoff are below currently developed TMDL standards. This indication is based on ODOT 1993-95 characterization monitoring and current TMDLs.

Requirements of a TMDL Implementation Plan

Designated Management Agencies appointed by DEQ are required to develop a watershed management plan once the TMDL for the watershed is defined. EPA and DEQ have listed the following requirements as essential elements of a watershed TMDL Implementation plan:

1) Proposed management measures tied to attainment of the TMDL. This will include a list of sources by category or sub-category of activity;
2) Timeline for implementation, including a schedule for revising permits, and a schedule for completion of measurable milestones (including appropriate incremental, measurable water quality targets and milestones for implementing control actions);
3) Timeline for attainment of water quality standards, including an explanation of how implementation is expected to result in the attainment of water quality standards;
4) Identification of responsible participants demonstrating who is responsible for implementing the various measures;
5) Reasonable assurance of implementation;
6) Monitoring and evaluation, including identification of parties responsible for monitoring, and a plan and schedule for revision of the TMDL and/or implementation plan;
7) Public involvement;
8) Maintenance of effort over time;
9) Discussion of cost and funding;
10) Citation to legal authorities under which the implementation will be conducted.

1) Proposed Management Measures tied to attainment of TMDLs.

ODOT has two business lines: project development and construction, and maintenance. There are management measures, processes, requirements and reviews included with each business line that are tied to the TMDL programs. These include:

- The ODOT MS4 NPDES permit and permit application- addresses sediment and temperature TMDL, includes project development and construction, and maintenance.
- The ODOT NPDES 1200 CA Permit- addresses sediment TMDL for construction.
- The ODOT Erosion and Sediment Control Manual-addresses sediment TMDL for construction and maintenance.

- The ODOT Routine Road Maintenance Water Quality and Habitat Guide, Best Management Practices, July 1999- addresses sediment and temperature TMDL.
- National Environmental Policy Act: addresses sediment and temperature TMDL, and habitat issues.
- Endangered Species Act requirements for project development: addresses sediment and temperature TMDL, and habitat issues.

2) Timeline for Implementation
ODOT already implements many water quality management measures as directed by state and federal law. Implementation timelines for currently developing measures are described in ODOT's MS4 NPDES permit. The ODOT MS4 permit was recently issued and is valid until May 31, 2005. ODOT's regional construction permits (1200 CA) are scheduled for renewal in December 2000.

3) Timeline for Attainment of Water Quality Standards
The complete attainment of load allocations applicable to ODOT corridors may not be feasible, certainly in the short term, and likely in the long term due to safety concerns and other important factors. However, ODOT expects to implement every practicable and reasonable effort to achieve the load allocations when considering new or modifications to existing corridors, and changes in operation and maintenance activities.

4) Identification of Responsible Participants
Implementing the ODOT best management measures is the responsibility of every ODOT employees. ODOT Managers are held accountable for ensuring employees and actions meet agency policy, and state and federal law, including the Clean Water Act.

5) Reasonable Assurance of Implementation
ODOT is required by its state NPDES MS4 permit to implement a storm water management plan. In addition, as a federally funded agency, ODOT is required to comply with the Endangered Species act and the Clean Water Act as part of project development. Recent agreements with NMFS require ODOT to implement best management practices for routine road maintenance.

6) Monitoring and Evaluation (see MS4 Permit Application)
ODOT's monitoring and evaluation program is tied to performing research projects that address best management practices and effectiveness of the practices.

7) Public Involvement
DEQ held public hearings on the ODOT MS4 Storm water Management Plan throughout Oregon. In addition, NMFS held a series of public hearings on the ESA 4(d) rule, which included the ODOT Routine Road Maintenance Best Management Practices. ODOT project development under goes a public involvement process that includes review by regulating agencies, and public hearings and meetings.

8) Maintenance of Effort Over Time
The elements of the ODOT water quality and habitat programs are bound in state and federal law, and state and agency directives. Consequently, the ODOT programs are standard operating practice.

9) Discussion of Cost and Funding
ODOT revenue comes primarily from dedicated funds collected as state and federal gasoline taxes. The Oregon Constitution dedicates taxes associated with motor vehicle fuel, and the ownership, operation and use of motor vehicles for the construction, reconstruction, improvement, repair, maintenance, operation and use of public highways. Consequently, ODOT is unable to expend resources outside its rights of way, or on activities not directly related to ODOT highways. ODOT construction projects are funded through a variety of Federal Highway Administration funding programs, including the Transportation Equity Act (TEA-21), state gas tax dollars, local and matching funds and bond.

ODOT budgets are identified the preceding year for the following biennium. Each ODOT section or district budgets as necessary to fulfill the requirements of its identified programs. ODOT determines the budget for its MS4 permit as program needs develop and as agency funds allow. ODOT Office of Maintenance, through the Clean Water/Salmon Recovery Program allocates funds to maintenance forces for betterment projects that improve water quality and salmon habitat.

The Oregon Transportation Commission and the Oregon State Legislature approve the ODOT budget.

10) Citation to Legal Authorities - See MS4 Permit Application
ODOT has legal authority only over ODOT right of way.

Conclusion

ODOT programs are adaptive and are expected to change as new information becomes available. ODOT will continue to work with the DEQ, NMFS, USFWS, and ODFW in best management practices, research opportunities, training, etc. The ODOT program meets the requirements of the TMDL Implementation Plans, and will be attached as appropriate to individual watershed plans.

WQMP ATTACHMENT D -- LIST OF 303(D) LISTED STREAMS IN THE UMPQUA BASIN

The 2006 Umpqua Basin Total Maximum Daily Loads apply to 219 listings on DEQ's 2004-06 303(d) list (list of impaired waters) as shown in the following tables. The last table shows the 43 stream segments on the list which are not covered by the 2006 Umpqua Basin TMDLs.

NORTH UMPQUA SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS

Waterbody	Segment	Parameter	Applicable Water Quality Standard	Stream Miles
Unnamed Waterbody (Tributary to Rock Creek)	Mouth to Headwaters RM 0 – 2.8	Temperature – Spawning 9/1 – 5/31	OAR 340-041-0028(4)(a)	2.8
Big Bend Creek	Mouth to Headwaters RM 0 – 10.6	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	10.6
Boulder Creek	Mouth to Headwaters RM 0 – 8.7	Temperature – Spawning	OAR 340-041-0028(4)(a)	8.7
Calf Creek	Mouth to Headwaters RM 0 – 8.0	Temperature – Spawning	OAR 340-041-0028(4)(a)	8.0
Calf Creek	Mouth to Headwaters RM 0 – 8.0	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	8.0
Canton Creek	Mouth to Headwaters RM 0 – 16.5	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	16.5
Cedar Creek	Mouth to Headwaters RM 0 – 1.9	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	1.9
City Creek	Mouth to Headwaters RM 0 – 6.6	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	6.6
Clover Creek	Mouth to Headwaters RM 0 – 4.2	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	4.2
Copeland Creek	Mouth to Headwaters RM 0 – 11.6	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	11.6
Copeland Creek	Mouth to Headwaters RM 0 – 11.6	Temperature – Spawning	OAR 340-041-0028(4)(a)	11.6
Diamond Lake	Lake RM 0 – 3.7	Aquatic Weeds/ Algae	OAR 340-041-0007(11)	3.7
Diamond Lake	Lake RM 0 – 3.7	Dissolved Oxygen – Year Round	OAR 340-041-0016(1)(b)	3.7
Diamond Lake	Lake RM 0 – 3.7	pH – Fall, Winter, Spring	OAR 340-041-0326(1)(c)	3.7
Diamond Lake	Lake RM 0 – 3.7	pH - Summer	OAR 340-041-0326(1)(b)	3.7
Diamond Lake	Lake RM 0 – 3.7	pH – Summer	OAR 340-041-0326(1)(c)	3.7
East Fork Copeland Creek	Mouth to Headwaters RM 0 – 3	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	3.0
East Fork Rock Creek	Mouth to Unnamed Trib RM 0 – 4.9	Temperature – Spawning 10/15 – 6/15	OAR 340-041-0028(4)(a)	4.9
East Fork Rock Creek	Mouth to Headwaters RM 0 – 6	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	6.0
East Fork Steamboat Creek	Mouth to Headwaters RM 0 – 3	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	3.0
East Pass Creek	Mouth to Headwaters RM 0 - 3	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	3.0

NORTH UMPQUA SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS				
Waterbody	**Segment**	**Parameter**	**Applicable Water Quality Standard**	**Stream Miles**
Eggleston Creek	Mouth to Headwaters RM 0 – 2.7	Temperature – Spawning 1/1 – 6/15	OAR 340-041-0028(4)(a)	2.7
Fish Creek	Mouth to PPL Diversion RM 0 – 6.9	Dissolved Oxygen (DO) – Cold Water – Summer	OAR 340-041-0016(1)(b)	6.9
Fish Creek	Mouth to Headwaters RM 0 – 18.6	Temperature – Rearing	OAR 340-041-0028(4)(c)	18.6
Harrington Creek	Mouth to Headwaters RM 0 – 3.8	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	3.8
Honey Creek	Mouth to Headwaters RM 0 – 3.2	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	3.2
Horse Heaven Creek	Mouth to Headwaters RM 0 – 6.3	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	6.3
Lake Creek	Lemolo Lake to Diamond Lake RM 0 – 11.5	pH - Summer	OAR 340-041-0326(1)(b)	11.5
Lake Creek	Lemolo Lake to Diamond Lake RM 0 – 11.5	Temperature – Rearing	OAR 340-041-0028(4)(c)	11.5
Little Rock Creek	Mouth to Headwaters RM 0 – 6.6	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	6.6
North Fork East Fork Rock Creek	Mouth to Headwaters RM 0 – 4.2	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	4.2
North Umpqua River	Mouth to upstream of Boulder Creek RM 0 – 68.9	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	68.9
Northeast Rock Creek	Mouth to Headwaters RM 0 – 6.1	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	6.1
Panther Creek	Mouth to Junction Creek, RM 0 – 1.7	Temperature – Spawning	OAR 340-041-0028(4)(a)	1.7
Panther Creek	Mouth to Junction Creek, RM 0 – 1.7	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	1.7
Pass Creek	Mouth to Headwaters RM 0 – 5.6	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	5.6
Rattlesnake Creek	Mouth to Headwaters RM 0 – 1.4	Temperature – Spawning 1/1 - 6/15	OAR 340-041-0028(4)(a)	1.4
Rock Creek	Mouth to Stony Creek RM 0 – 10.2	Temperature – Spawning 9/1 – 6/15	OAR 340-041-0028(4)(a)	10.2
Rock Creek	Mouth to Headwaters RM 0 – 19.1	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	19.1
Scaredman Creek	Mouth to Headwaters RM 0 – 2.1	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	2.1
Steamboat Creek	Mouth to Deep Creek RM 0 – 6.1	Dissolved Oxygen (DO) – Cold Water – Summer	OAR 340-041-0016(1)(b)	6.1

NORTH UMPQUA SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS

Waterbody	Segment	Parameter	Applicable Water Quality Standard	Stream Miles
Steamboat Creek	Mouth to Deep Creek RM 0 – 6.1	pH – Summer	OAR 340-041-0326(1)(b)	6.1
Steamboat Creek	Deep Creek to Big Bend Creek RM 6.1 – 10.9	pH – Summer	OAR 340-041-0326(1)(b)	4.8
Steamboat Creek	Big Bend Creek to Headwaters R 10.9 – 23.4	pH – Summer	OAR 340-041-0326(1)(b)	12.5
Steamboat Creek	Mouth to Big Bend Creek RM 0 – 10.9	Temperature – Spawning 9/1 – 6/15	OAR 340-041-0028(4)(a)	10.9
Steamboat Creek	Mouth to Headwaters RM 0 – 23.4	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	23.4
Steelhead Creek	Mouth to Headwaters RM 0 – 4.8	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	4.8
Susan Creek	Mouth to Headwaters RM 0 – 4.3	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	4.3
Watson Creek	Mouth to Headwaters RM 0 – 7.7	Temperature – Spawning	OAR 340-041-0028(4)(a)	7.7
Total Stream Miles Listed			Aquatic Weeds/Algae	3.7
Total Stream Miles Listed			Dissolved Oxygen	16.7
Total Stream Miles Listed			pH[1]	38.6
Total Stream Miles Listed			Temperature – Rearing	247.3
Total Stream Miles Listed			Temperature – Spawning	70.6
Total Stream Miles Listed for One or More Parameter[2]				291.6

[1] Diamond Lake has three pH listings but was counted only once in the total.
[2] Streams listed for more than one parameter were counted only once in the total.

SOUTH UMPQUA SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS

Waterbody	Segment	Parameter	Applicable Water Quality Standard	Stream Miles
Unnamed Waterbody – Trib of West Fork Canyon Creek	Mouth to Headwaters RM 0 – 2.9	Temperature – Spawning – 9/15 – 5/31	OAR 340-041-0028(4)(a)	2.9
Unnamed Waterbody – Trib of West Fork Canyon Creek	Mouth to Headwaters RM 0 – 2.9	Temperature - Rearing	OAR 340-041-0028(4)(c)	2.9
Applegate Creek	Mouth to Headwaters RM 0 – 4.8	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	4.8
Bear Creek	Mouth to Headwaters RM 0 – 4.7	Temperature - Rearing	OAR 340-041-0028(4)(c)	4.7
Beaver Creek	Mouth to Beaver Lake RM 0 – 2.1	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	2.1
Black Canyon Creek	Mouth to Headwaters RM 0 – 5.2	pH - Summer	OAR 340-041-0326(1)(b)	5.2

SOUTH UMPQUA SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS				
Waterbody	**Segment**	**Parameter**	**Applicable Water Quality Standard**	**Stream Miles**
Black Rock Fork	Mouth to Unnamed Trib RM 0 – 6.4	Temperature – Spawning – 9/1 – 6/15	OAR 340-041-0028(4)(a)	6.4
Black Rock Fork	Mouth to Headwaters RM 0 – 9.7	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	9.7
Boulder Creek	Mouth to Headwaters RM 0 – 10.7	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	10.7
Brownie Creek	Mouth to Headwaters RM 0 – 5.8	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	5.8
Buck Fork	Mouth to Headwaters RM 0 – 4.4	Temperature - Rearing	OAR 340-041-0028(4)(c)	4.4
Buckeye Creek	Mouth to Coyote Creek RM 0 – 9.8	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	9.8
Callahan Creek (Elk Creek drainage)	Mouth to Headwaters RM 0 – 6.2	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	6.2
Canyon Creek	Mouth to Packard Creek RM 0 – 6.2	Temperature – Spawning – 10/15 - 5/15	OAR 340-041-0028(4)(a)	6.2
Canyon Creek	Mouth to Headwaters RM 0 – 9.9	Temperature - Rearing	OAR 340-041-0028(4)(c)	9.9
Castle Rock Fork	Mouth to Headwaters RM 0 – 11.9	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	11.9
Cattle Creek	Mouth to Headwaters RM 0 – 3.2	Temperature – Spawning – 10/15 – 5/15	OAR 340-041-0028(4)(a)	3.2
Cattle Creek	Mouth to Headwaters RM 0 – 3.2	Temperature - Rearing	OAR 340-041-0028(4)(c)	3.2
Coffee Creek	Mouth to Ruby Creek RM 0 – 2.5	Temperature – Spawning 1/1 – 6/15	OAR 340-041-0028(4)(a)	2.5
Coffee Creek	Mouth to Headwaters RM 0 – 9.4	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	9.4
Cow Creek	Mouth to West Fork Cow Creek RM 0 – 26.3	pH - Summer	OAR 340-041-0326(1)(b)	26.3
Cow Creek	Mouth to Susan Creek RM 0 – 29.3	Temperature - Rearing	OAR 340-041-0028(4)(c)	29.3
Dads Creek	Mouth to Headwaters RM 0 – 3.4	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	3.4
Days Creek	Mouth to Headwaters RM 0 – 13.8	Temperature - Rearing	OAR 340-041-0028(4)(c)	13.8
Deadman Creek	Mouth to Middle Fork RM 0 – 9.0	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	9.0
Deer Creek	Mouth to Headwaters RM 0 – 9.6	Dissolved Oxygen – Year-round	OAR 340-041-0016(1)(b)	9.6
Deer Creek	Mouth to Headwaters RM 0 – 9.6	Bacteria – Fall, Winter, Spring – E.coli	OAR 340-041-0009(1)(a)	9.6

SOUTH UMPQUA SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS				
Waterbody	**Segment**	**Parameter**	**Applicable Water Quality Standard**	**Stream Miles**
Deer Creek	Mouth to Headwaters RM 0 – 9.6	Bacteria – Fall, Winter, Spring – Fecal coliform	OAR 340-041-0009(1)(a)	9.6
Deer Creek	Mouth to Headwaters RM 0 – 9.6	Bacteria – Summer – Fecal coliform	OAR 340-041-0009(1)(a)	9.6
Deer Creek	Mouth to Headwaters RM 0 – 9.6	Temperature – Spawning 9/15 – 5/31	OAR 340-041-0028(4)(a)	9.6
Deer Creek	Mouth to Headwaters RM 0 – 9.6	Temperature – Rearing	OAR 340-041-0028(4)(c)	9.6
Dismal Creek	Mouth to Headwaters RM 0 – 2.7	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	2.7
Doe Creek	Mouth to Headwaters RM 0 – 4.8	Temperature – Rearing	OAR 340-041-0028(4)(c)	4.8
Drew Creek	Mouth to Headwaters RM 0 – 8.3	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	8.3
Dumont Creek	Mouth to Straight Creek RM 0 – 2.9	Biological Criteria	OAR 340-041-0011	2.9
Dumont Creek	Straight Creek to Headwaters RM 2.9 – 9.5	Temperature – Spawning 1/1 – 6/15	OAR 340-041-0028(4)(a)	6.6
Dumont Creek	Mouth to Headwaters RM 0 – 9.5	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	9.5
East Fork Creek[1]	RM 0 - 0	Temperature – Rearing	OAR 340-041-0028(4)	0
East Fork Deadman Creek	Mouth to Headwaters RM 0 – 5.8	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	5.8
East Fork Stouts Creek	Mouth to Headwaters RM 0 – 4.9	Temperature - Rearing	OAR 340-041-0028(4)(c)	4.9
Elk Creek	Mouth to Headwaters RM 0 – 14.6	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	14.6
Elk Valley Creek	RM 1.9 to Headwaters RM 1.9 – 6.0	Temperature - Rearing	OAR 340-041-0028(4)(c)	4.1
Fate Creek	Mouth to Headwaters RM 0 – 2.5	Temperature - Rearing	OAR 340-041-0028(4)(c)	2.5
Flat Creek	Mouth to Headwaters RM 0 – 5.0	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	5.0
Fortune Branch	Mouth to Headwaters RM 0 – 4.7	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	4.7
Francis Creek	Mouth to Headwaters RM 0 – 3.7	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	3.7
Jackson Creek	Mouth to Headwaters RM 0 – 25.0	Biological Criteria	OAR 340-041-0011	25.0
Jackson Creek	Mouth to Headwaters RM 0 – 25.0	pH - Summer	OAR 340-041-0326(1)(b)	25.0
Jackson Creek	Soup Creek to Lonewoman Creek RM 14.7 – 21.5	Temperature – Spawning 9/1 – 6/15	OAR 340-041-0028(4)(a)	6.8

SOUTH UMPQUA SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS				
Waterbody	**Segment**	**Parameter**	**Applicable Water Quality Standard**	**Stream Miles**
Jackson Creek	Mouth to Headwaters RM 0 – 25.0	Temperature – Core Cold Water	OAR 340-041-0028(4)(c)	25.0
Joe Hall Creek	Mouth to Headwaters RM 0 – 3.4	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	3.4
Johnson Creek	Mouth to Headwaters RM 0 – 1.2	Temperature - Rearing	OAR 340-041-0028(4)(c)	1.2
Lavadoure Creek	Mouth to Headwaters RM 0 – 2.2	Temperature - Rearing	OAR 340-041-0028(4)(c)	2.2
Letitia Creek	Mouth to Headwaters Rm 0 – 3.4	Temperature – Rearing	OAR 340-041-0028(4)(c)	3.4
Lookingglass Creek	Mouth to Headwaters RM 0 – 11.1	Temperature – Rearing	OAR 340-041-0028(4)(c)	11.1
Louis Creek	Mouth to Headwaters RM 0 – 9.2	Temperature – Rearing	OAR 340-041-0028(4)(c)	9.2
Middle Creek	Mouth to Unnamed Trib RM 0 – 10.1	Temperature – Spawning – 10/15 – 5/15	OAR 340-041-0028(4)(a)	10.1
Middle Creek	Mouth to Headwaters RM 0 – 12.8	Temperature – Rearing	OAR 340-041-0028(4)(c)	12.8
Middle Fork Deadman Creek	Mouth to Headwaters RM 0 – 4.6	Temperature – Spawning – 9/15 – 5/31	OAR 340-041-0028(4)(a)	4.6
Middle Fork Deadman Creek	Mouth to Headwaters RM 0 – 4.6	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	4.6
Mitchell Creek	Mouth to Headwaters RM 0 – 4.2	Temperature – Rearing	OAR 340-041-0028(4)(c)	4.2
North Fork Deer Creek	Mouth to Headwaters RM 0 – 6.7	Bacteria – Fall, Winter, Spring – E.coli	OAR 340-041-0009(1)(a)	6.7
North Fork Deer Creek	Mouth to Headwaters RM 0 – 6.7	Bacteria – Summer – E.coli	OAR 340-041-0009(1)(a)	6.7
North Myrtle Creek	Mouth to Headwaters RM 0 – 18.3	Bacteria – Summer – E.coli	OAR 340-041-0009(1)(a)	18.3
North Myrtle Creek	Mouth to Headwaters RM 0 – 18.3	Temperature – Rearing	OAR 340-041-0028(4)(c)	18.3
Olalla Creek	Mouth to Thompson Creek RM 0 – 15.6	Biological Criteria	OAR 340-041-0011	15.6
Olalla Creek	Mouth to Headwaters RM 0 – 21.8	Temperature – Rearing	OAR 340-041-0028(4)(c)	21.8
Quartz Creek	Mouth to Headwaters RM 0 – 8.4	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	8.4
Quines Creek	Mouth to Headwaters RM 0 – 6.0	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	6.0
Rice Creek	Mouth to Headwaters RM 0 – 6. 8	Temperature – Rearing	OAR 340-041-0028(4)(c)	6.8
Riffle Creek	Mouth to Headwaters RM 0 – 5.7	Temperature – Rearing	OAR 340-041-0028(4)(c)	5.7
Riser Creek	Mouth to Headwaters RM 0 – 4.1	Temperature – Rearing	OAR 340-041-0028(4)(c)	4.1

SOUTH UMPQUA SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS				
Waterbody	**Segment**	**Parameter**	**Applicable Water Quality Standard**	**Stream Miles**
School Hollow	Mouth to Headwaters RM 0 – 1.6	Temperature - Rearing	OAR 340-041-0028(4)(c)	1.6
Shively Creek	Mouth to Headwaters RM 0 – 5.2	Temperature - Rearing	OAR 340-041-0028(4)(c)	5.2
Skull Creek	Mouth to Headwaters RM 0 – 2.0	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	2.0
Slick Creek	Mouth to Headwaters RM 0 – 4.9	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	4.9
Slide Creek	Mouth to Headwaters RM 0 – 4.4	Temperature - Rearing	OAR 340-041-0028(4)(c)	4.4
Snow Creek	Mouth to Headwaters RM 0 – 5.3	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	5.3
South Fork Middle Creek	Mouth to Headwaters RM 0 – 4.4	Temperature - Rearing	OAR 340-041-0028(4)(c)	4.4
South Myrtle Creek	Mouth to Headwaters RM 0 – 22.2	Temperature – Rearing	OAR 340-041-0028(4)(c)	22.2
South Umpqua River	Mouth to Roberts Creek RM 0 – 15.9	Aquatic Weeds/Algae	OAR 340-041-0007(11)	15.9
South Umpqua River	Roberts Creek to Days Creek RM 15.9 – 57.7	Aquatic Weeds/Algae	OAR 340-041-0007(11)	41.8
South Umpqua River	Mouth to Roberts Creek RM 0 – 15.9	Biological Criteria	OAR 340-041-0011	15.9
South Umpqua River	Roberts Creek to Days Creek RM 15.9 – 57.7	Biological Criteria	OAR 340-041-0011	41.8
South Umpqua River	Roberts Creek to Days Creek RM 15.9 – 57.7	Chlorophyll a - Summer	OAR 340-041-0009(1)(a)	41.8
South Umpqua River	Mouth to Corn Creek RM 0 – 68.8	Dissolved Oxygen Year Round Non Spawning	OAR 340-041-0016(1)(b)	68.8
South Umpqua River	Roberts Creek to Days Creek RM 15.9 – 57.7	Bacteria – Summer – E.coli	OAR 340-041-0009(1)(a)	41.8
South Umpqua River	Roberts Creek to Days Creek RM 15.9 – 57.7	Bacteria –Summer – fecal coliform	OAR 340-041-0009(1)(a)	41.8
South Umpqua River	Mouth to RM 5.0 RM 0 – 5.0	pH – Fall, Winter, Spring	OAR 340-041-0326(1)(b)	5.0
South Umpqua River	Mouth to Roberts Creek RM 0 – 15.9	pH – Spawning - 6/1 – 9/30	OAR 340-041-0326(1)(b)	15.9
South Umpqua River	Roberts Creek to Days Creek RM 15.9 – 57.7	pH - Summer	OAR 340-041-0326(1)(b)	41.8
South Umpqua River	Days Creek to Castle Rock/Black Rock Forks RM 57.7 – 102.2	pH - Summer	OAR 340-041-0326(1)(b)	44.5
South Umpqua River	Mouth to Roberts Creek RM 0 – 15.9	Nutrients – Phosphorus	OAR 340-041-0007(11)	15.9

SOUTH UMPQUA SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS

Waterbody	Segment	Parameter	Applicable Water Quality Standard	Stream Miles
South Umpqua River	Mouth to Corn Creek RM 0 – 68.8	Temperature - Rearing	OAR 340-041-0028(4)(c)	68.8
South Umpqua River	Corn Creek to Castle Rock/Black Rock Forks RM 68.8 – 102.1	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	33.3
Stouts Creek	Mouth to Headwaters RM 0 – 7.9	Temperature - Rearing	OAR 340-041-0028(4)(c)	7.9
Thompson Creek	Mouth to Headwaters RM 0 – 7.6	Temperature - Rearing	OAR 340-041-0028(4)(c)	7.6
Union Creek	Mouth to Headwaters RM 0 – 7.0	Temperature - Rearing	OAR 340-041-0028(4)(c)	7.0
Weaver Creek	Mouth to Headwaters RM 0 – 5.8	Temperature - Rearing	OAR 340-041-0028(4)(c)	5.8
West Fork Canyon Creek	Mouth to Unnamed Trib RM 0 – 2.4	Temperature – Spawning 10/15 – 5/15	OAR 340-041-0028(4)(a)	2.4
West Fork Canyon Creek	Mouth to Headwaters RM 0 – 8.8	Temperature - Rearing	OAR 340-041-0028(4)(c)	8.8
West Fork Cow Creek	Mouth to East Fork West Fork Cow RM 0 – 17.9	Temperature - Rearing	OAR 340-041-0028(4)(c)	17.9
Windy Creek	Mouth to Headwaters RM 0 – 9.4	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	9.4
Wood Creek	Mouth to Headwaters RM 0 – 4.0	Temperature – Spawning 10/15 – 6/15	OAR 340-041-0028(4)(a)	4.0
Wood Creek	Mouth to Headwaters RM 0 – 4.0	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	4.0
Woodford Creek	Mouth to Headwaters RM 0 – 3.5	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	3.5
Total Stream Miles Listed			Aquatic Weeds/Algae	57.7
Total Stream Miles Listed			Bacteria, FWS[2]	16.3
Total Stream Miles Listed			Bacteria – Summer[3]	76.4
Total Stream Miles Listed			Biological Criteria	101.2
Total Stream Miles Listed			Chlorophyll a	41.8
Total Stream Miles Listed			Dissolved Oxygen	78.4
Total Stream Miles Listed			Nutrients	15.9
Total Stream Miles Listed			pH	163.7
Total Stream Miles Listed			Temperature - Rearing	603.4
Total Stream Miles Listed			Temperature - Spawning	65.3
Total Stream Miles Listed for One or More Parameter[4]				728

[1] There is no East Fork Creek in the Umpqua Basin. This listing is in error.
[2] Segments listed for both E.coli and fecal coliform were counted only once in the total.
[3] Segments listed for both E.coli and fecal coliform were counted only once in the total.
[4] Streams listed for more than one parameter were counted only once in the total.

UMPQUA MAINSTEM SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS

Waterbody	Segment	Parameter	Applicable Water Quality Standard	Stream Miles
Unnamed Waterbody (Tributary to Little South Fork Smith River)	Mouth to Headwaters RM 0 – 1.4	Temperature – Spawning 9/15 – 5/31	OAR 340-041-0028(4)(a)	1.4
Brush Creek	Mouth to RM 7.4 above Blue Hole Creek RM 0 –7.4	Temperature – Rearing	OAR 340-041-0028(4)(c)	7.4
Buck Creek	Mouth to West Fork RM 0 – 0.7	Temperature – Rearing	OAR 340-041-0028(4)(c)	0.7
Bum Creek	Mouth to Headwaters RM 0 – 2.3	Temperature – Rearing	OAR 340-041-0028(4)(c)	2.3
Calapooya Creek	Mouth to Headwaters RM 0 – 36.1	Dissolved Oxygen (DO) Cold Water	OAR 340-041-0016(1)(b)	36.1
Calapooya Creek	Mouth to Oldham Creek RM 0 – 18.7	Bacteria – E.coli, Fall, Winter, Spring	OAR 340-041-0009(1)(a)	18.7
Calapooya Creek	Oldham Creek to Long Valley Creek RM 18.7 – 25.3	Bacteria – E.coli, Fall, Winter, Spring	OAR 340-041-0009(1)(a)	6.6
Calapooya Creek	Mouth to Oldham Creek RM 0 – 18.7	Bacteria – fecal coliform, Fall, Winter, Spring	OAR 340-041-0009(1)(a)	18.7
Calapooya Creek	Mouth to Oldham Creek RM 0 – 18.7	pH – Summer	OAR 340-041-0326(1)(b)	18.7
Calapooya Creek	Oldham Creek to Long Valley Creek RM 18.7 – 25.3	pH – Summer	OAR 340-041-0326(1)(b)	6.6
Calapooya Creek	Mouth to Headwaters RM 0 – 36.1	Temperature - Rearing	OAR 340-041-0028(4)(c)	36.1
Camp Creek	Mouth to Headwaters RM 0 – 20.5	Temperature - Rearing	OAR 340-041-0028(4)	20.5
Carpenter Creek	Mouth to Headwaters RM 0 – 1.3	Temperature - Rearing	OAR 340-041-0028(4)	1.3
Cedar Creek	Mouth to Headwaters RM 0 – 3.0	Temperature - Rearing	OAR 340-041-0028(4)	3.0
Cleghorn Creek	Mouth to Headwaters RM 0 – 2.8	Temperature – Spawning 9/15 – 5/31	OAR 340-041-0028(4)(a)	2.8
Elk Creek	Mouth to Headwaters RM 0 – 45.6	Dissolved Oxygen (DO) – Cold Water	OAR 340-041-0016(1)(b)	45.6
Elk Creek	Mouth to Yoncalla Creek RM 0 – 25.9	Bacteria – E. coli Fall, Winter, Spring	OAR 340-041-0009(1)(a)	25.9
Elk Creek	Yoncalla Creek to Headwaters RM 25.9 – 45.6	Bacteria – E. coli Fall, Winter, Spring	OAR 340-041-0009(1)(a)	19.7
Elk Creek	Mouth to Yoncalla Creek RM 0 – 25.9	Bacteria – fecal coliform, Fall, Winter, Spring	OAR 340-041-0009(1)(a)	25.9

UMPQUA MAINSTEM SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS

Waterbody	Segment	Parameter	Applicable Water Quality Standard	Stream Miles
Elk Creek	Mouth to Yoncalla Creek RM 0 – 25.9	pH - Summer	OAR 340-041-0016(1)(b)	25.9
Elk Creek	Mouth to Headwaters RM 0 – 45.6	Temperature - Rearing	OAR 340-041-0028(4)(c)	45.6
Franklin Creek	Mouth to Headwaters RM 0 – 4.5	Temperature - Rearing	OAR 340-041-0028(4)(c)	4.5
Halfway Creek	Mouth to West Fork Halfway Creek RM 0 – 1.1	Temperature - Rearing	OAR 340-041-0028(4)(c)	1.1
Halfway Creek Tributary	Mouth to Headwaters RM 0 – 1.2	Temperature – Core Cold Water	OAR 340-041-0028(4)(b)	1.2
Heddin Creek	Mouth to Headwaters RM 0 – 3.7	Temperature - Rearing	OAR 340-041-0028(4)(c)	3.7
Herb Creek	Mouth to Headwaters RM 0 – 2.7	Temperature – Rearing	OAR 340-041-0028(4)(c)	2.7
Johnson Creek	Mouth to Headwaters RM 0 – 4.3	Temperature- Rearing	OAR 340-041-0028(4)(c)	4.3
Little Mill Creek	Mouth to Headwaters RM o – 4.1	Temperature- Rearing	OAR 340-041-0028(4)(c)	4.1
Little Wolf Creek	Mouth to Headwaters RM 0 – 5.4	Temperature- Rearing	OAR 340-041-0028(4)(c)	5.4
Lost Creek	Mouth to Headwaters Rm 0 – 5.3	Temperature- Rearing	OAR 340-041-0028(4)(c)	5.3
Lutsinger Creek	Mouth to Headwaters RM 0 – 5.4	Temperature- Rearing	OAR 340-041-0028(4)(c)	5.4
Mehl Creek	Mouth to RM 1.5 RM 0 – 1.5	Temperature- Rearing	OAR 340-041-0028(4)(c)	1.5
Middle Fork North Fork Smith River	Mouth to Headwaters RM 0 – 4.6	Temperature – Rearing	OAR 340-041-0028(4)(c)	4.6
Miner Creek	Mouth to Headwaters RM 0 – 4.2	Temperature- Rearing	OAR 340-041-0028(4)(c)	4.2
North Branch of Middle Fork of North Fork Smith	Mouth to Unnamed Tributary RM 0 – 1.0	Temperature- Rearing	OAR 340-041-0028(4)(c)	1.0
North Fork Smith River	Middle Fork to Headwaters RM 19.1 – 31.8	Biological Criteria	OAR 340-041-0011	12.7
North Fork Smith River	Mouth to Headwaters RM 0 – 31.8	Temperature - Rearing	OAR 340-041-0028(4)(c)	31.8
North Fork Tom Folley Creek	Mouth to Headwaters RM 0 – 3.9	Temperature- Rearing	OAR 340-041-0028(4)(c)	3.9
Pass Creek	Mouth to Headwaters RM 0 – 14.2	Temperature- Rearing	OAR 340-041-0028(4)(c)	14.2
Rader Creek	Mouth to Headwaters RM 0 – 4.7	Temperature- Rearing	OAR 340-041-0028(4)(c)	4.7
Russell Creek	Mouth to Headwaters RM 0 – 2.2	Temperature - Rearing	OAR 340-041-0028(4)(c)	2.2

UMPQUA MAINSTEM SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS				
Waterbody	**Segment**	**Parameter**	**Applicable Water Quality Standard**	**Stream Miles**
Scholfield Creek	Tidal Portion of the Slough RM 0 – 5.0	Bacteria – fecal coliform All year - shellfish	OAR 340-041-0009(1)(b)	5.0
Smith River	Mouth to Frantz Creek RM 0 – 3.3	Bacteria – fecal coliform All year - shellfish	OAR 340-041-0009(1)(b)	3.3
Smith River	Mouth to Headwaters RM 0 – 88.5	Temperature - Rearing	OAR 340-041-0028(4)(c)	88.5
Soup Creek	Mouth to North Fork RM 0 – 1.4	Temperature- Rearing	OAR 340-041-0028(4)(c)	1.4
South Fork Smith River	Mouth to Headwaters RM 0 – 7.0	Temperature - Rearing	OAR 340-041-0028(4)(c)	7.0
South Sister Creek	Mouth to Headwaters RM 0 – 8.6	Temperature - Rearing	OAR 340-041-0028(4)(c)	8.6
Tom Folley Creek	Mouth to Headwaters RM 0 – 8.2	Temperature- Rearing	OAR 340-041-0028(4)(c)	8.2
Umpqua River	Little Mill Creek (Scottsburg) to North/South Fork RM 25.9 – 109.3	Bacteria – E. coli, Fall, Winter, Spring	OAR 340-041-0009(1)(a)	83.4
Umpqua River	Little Mill Creek (Scottsburg) to North/South Fork RM 25.9 – 109.3	Bacteria – fecal coliform, Fall, Winter, Spring	OAR 340-041-0009(1)(a)	83.4
Umpqua River	Bay; Mouth to Marker 6a RM 0 - 1	Bacteria – fecal coliform All Year – shellfish	OAR 340-041-0009(1)(b)	1.0
Umpqua River	Bay; Marker 6a to Big Bend RM 1 – 6.7	Bacteria – fecal coliform All Year – shellfish	OAR 340-041-0009(1)(b)	5.7
Umpqua River	Bay; Marker No. 19 to 1 mile upstream of Reedsport RM 7.7 - 11.8	Bacteria –fecal coliform All year - shellfish	OAR 340-041-0009(1)(b)	4.1
Umpqua River	Bay; Reedsport to Little Mill Creek (Scottsburg) RM 10.7 – 25.9	Bacteria –fecal coliform All year - shellfish	OAR 340-041-0009(1)(b)	15.2
Umpqua River	Little Mill Creek (Scottsburg) to North/South Fork RM 25.9 – 109.3	Bacteria – fecal coliform, All year - shellfish	OAR 340-041-0009(1)(a)	83.4
Umpqua River	Mouth to Calapooya Creek RM 0 – 100.2	Temperature- Rearing	OAR 340-041-0028(4)(c)	100.2
Umpqua River	Calapooya Creek to confluence of North and South Umpqua Rivers RM 100.2 to 109.2	Temperature- Rearing	OAR 340-041-0028(4)(c)	9.0

UMPQUA MAINSTEM SUBBASIN 303(d) LISTED WATERS COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS

Waterbody	Segment	Parameter	Applicable Water Quality Standard	Stream Miles
Unnamed Waterbody (Tributary to Middle Fork North Fork Smith River)	Mouth to Headwaters RM 0 – 1.6	Temperature - Rearing	OAR 340-041-0028(4)(c)	1.6
West Branch North Fork Smith River	Mouth to Headwaters RM 0 – 3.4	Temperature - Rearing	OAR 340-041-0028(4)(c)	3.4
West Fork Smith River	Mouth to Headwaters RM 0 – 15.4	Temperature - Rearing	OAR 340-041-0028(4)(c)	15.4
Winchester Creek	Mouth to Headwaters RM 0 – 5.4	Bacteria – fecal coliform, All year – shellfish	OAR 340-041-0009(1)(a)	5.4
Wolf Creek	Mouth to Headwaters RM 0 – 7.6	Temperature - Rearing	OAR 340-041-0028(4)(c)	7.6
Yellow Creek	Mouth to Headwaters RM 0 – 9.1	Temperature- Rearing	OAR 340-041-0028(4)(c)	9.1
Yoncalla Creek	Mouth to Headwaters RM 0 – 8.3	Bacteria – E. coli Fall, Winter, Spring	OAR 340-041-0009(1)(a)	8.3
Total Stream Miles Listed			Biological Criteria	12.7
Total Stream Miles Listed			Bacteria – Fall, Winter, Spring[1]	162.6
Total Stream Miles Listed			Bacteria – All Year – Shellfish[2]	123.1
Total Stream Miles Listed			pH	25.3
Total Stream Miles Listed			Dissolved Oxygen	81.7
Total Stream Miles Listed			Temperature – Rearing	514.5
Total Stream Miles Listed			Temperature – Spawning	4.2
Total Stream Miles Listed for at Least One Parameter[3]				649.5

[1] Segments listed for both E. Coli and fecal coliform were counted only once in the total.
[2] Segments listed for both E. Coli and fecal coliform were counted only once in the total.
[3] Streams listed for more than one parameter were counted only once in the total.

Umpqua Basin 303(d) Listings (2004-06 List) Not Covered by 2006 Total Maximum Daily Loads

NORTH UMPQUA SUBBASIN 303(d) WATERS NOT COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS				
Waterbody	**Segment**	**Parameter**	**Applicable Water Quality Standard**	**Stream Miles**
Cooper Creek Reservoir/Cooper Creek	Reservoir RM 0 – 5.9	Toxics - Iron	OAR 340-041-0033(2)	5.9
Cooper Creek Reservoir/Cooper Creek	Reservoir RM 0 – 5.9	Toxics - Mercury	OAR 340-041-0033(2)	5.9
Cooper Creek Reservoir/Cooper Creek	Reservoir RM 0 – 5.9	Toxics - Mercury	OAR 340-041-0033(1)	5.9
North Umpqua River	Near confluence with Clearwater River RM 77 – 78	pH – Summer	OAR 340-041-0326(1)(b)	1.0
North Umpqua River	Mouth to Rock Creek RM 0 – 32.8	Temperature – Spawning 9/1 – 5/15	OAR 340-041-0028(4)(a)	32.8
North Umpqua River	Above Rock Creek to Steamboat Creek RM 35.1 – 41.4	Temperature – Spawning 9/1 – 5/15	OAR 340-041-0028(4)(a)	6.3
North Umpqua River	Above Steamboat Creek to upstream of Boulder Creek RM 45.2 – 68.9	Temperature – Spawning 9/1 – 5/15	OAR 340-041-0028(4)(a)	23.7
North Umpqua River	RM 35 to Steamboat Creek RM 35 - 52	Toxics - Arsenic	OAR 340-041-0033(2)	17.0
Plat I Reservoir	Reservoir RM 0 - 0	Toxics - Mercury	OAR 340-041-0033(1)	0
Sutherlin Creek	Mouth to Headwaters RM 0 – 16	Toxics - Arsenic	OAR 340-041-0033(2)	16
Sutherlin Creek	Mouth to Headwaters RM 0 – 16	Toxics - Arsenic (tri)	OAR 340-041-0033(2)	16
Sutherlin Creek	Mouth to Headwaters RM 0 – 16	Toxics - Beryllium	OAR 340-041-0033(2)	16
Sutherlin Creek	Unnamed Trib to Unnamed Trib RM 4.6 - 10	Toxics - Copper	OAR 340-041-0033(2)	5.4
Sutherlin Creek	Mouth to Headwaters RM 0 – 16	Toxics - Iron	OAR 340-041-0033(2)	16
Sutherlin Creek	Mouth to Headwaters RM 0 – 16	Toxics - Lead	OAR 340-041-0033(2)	16
Sutherlin Creek	Mouth to Headwaters RM 0 – 16	Toxics - Manganese	OAR 340-041-0033(2)	16
Unnamed Creek (Tributary to Sutherlin Creek)	RM 0 – 0	Toxics - Arsenic	OAR 340-041-0033(2)	0

NORTH UMPQUA SUBBASIN 303(d) WATERS NOT COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS				
Waterbody	**Segment**	**Parameter**	**Applicable Water Quality Standard**	**Stream Miles**
Unnamed Creek (Tributary to Sutherlin Creek)	RM 0 – 0	Toxics - Iron	OAR 340-041-0033(2)	0
Unnamed Creek (Tributary to Sutherlin Creek)	RM 0 – 0	Toxics - Lead	OAR 340-041-0033(2)	0

SOUTH UMPQUA SUBBASIN 303(d) LISTED WATERS NOT COVERED BY 2006 TMDLS

Waterbody	Segment	Parameter	Applicable Water Quality Standard	Stream Miles
Beaver Creek	Mouth to Beaver Lake RM 0 – 2.1	Sedimentation	OAR 340-041-0007(13)	2.1
Galesville Reservoir	Reservoir	Toxics – Mercury	OAR 340-041-0033(1)	N.A.
Jackson Creek	Mouth to Headwaters RM 0 – 25.0	Sedimentation	OAR 340-041-0007(13)	25.0
Middle Creek	Mouth to RM 0 – 12.8	Toxics - Arsenic	OAR 340-041-0033(2)	12.8
Middle Creek	Mouth to RM 0 – 12.8	Toxics – Cadmium	OAR 340-041-0033(2)	12.8
Middle Creek	Mouth to RM 0 – 12.8	Toxics - Copper	OAR 340-041-0033(2)	12.8
Middle Creek	Mouth to RM 0 – 12.8	Toxics – Manganese	OAR 340-041-0033(2)	12.8
Middle Creek	Mouth to RM 0 – 12.8	Toxics – Nickel	OAR 340-041-0033(2)	12.8
Middle Creek	Mouth to RM 0 – 12.8	Toxics - Zinc	OAR 340-041-0033(2)	12.8
Olalla Creek	Mouth to Headwaters RM 0 – 21.8	Toxics - Iron	OAR 340-041-0033(2)	21.8
South Fork Middle Creek	Mouth to RM 0 – 4.4	Toxics – Cadmium	OAR 340-041-0033(2)	4.4
South Fork Middle Creek	Mouth to RM 0 – 4.4	Toxics – Copper	OAR 340-041-0033(2)	4.4
South Fork Middle Creek	Mouth to RM 0 – 4.4	Toxics - Manganese	OAR 340-041-0033(2)	4.4
South Fork Middle Creek	Mouth to RM 0 – 4.4	Toxics - Zinc	OAR 340-041-0033(2)	4.4
South Umpqua River	Just below Jackson Creek to Castle Rock/Black Rock Forks RM 80 – 102	Sedimentation	OAR 340-041-0007(13)	22.0
South Umpqua River	Mouth to Roberts Creek RM 0 – 15.9	Toxics - Arsenic	OAR 340-041-0033(2)	15.9
South Umpqua River	Mouth to Roberts Creek RM 0 – 15.9	Toxics – Cadmium	OAR 340-041-0033(2)	15.9

UMPQUA MAINSTEM SUBBASIN 303(d) LISTED WATERS NOT COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS

Waterbody	Segment	Parameter	Applicable Water Quality Standard	Stream Miles
Calapooya Creek	Mouth to Headwaters RM 0 – 36 .2	Toxics – Iron	OAR 340-041-0033(2)	36.2
Calapooya Creek	Mouth to Oldham Creek RM 0 – 24.8	Dissolved Oxygen (DO) – Spawning 10/15 – 5/15	OAR 340-041-0016(1)(b)	24.8

UMPQUA MAINSTEM SUBBASIN 303(d) LISTED WATERS NOT COVERED BY 2006 TOTAL MAXIMUM DAILY LOADS				
Waterbody	**Segment**	**Parameter**	**Applicable Water Quality Standard**	**Stream Miles**
Cook Creek	Mouth to Headwaters RM 0 – 2.9	Toxics -Beryllium	OAR 340-041-0033(2)	2.9
Cook Creek	Mouth to Headwaters RM 0 – 2.9	Toxics - Copper	OAR 340-041-0033(2)	2.9
Cook Creek	Mouth to Headwaters RM 0 – 2.9	Toxics - Iron	OAR 340-041-0033(2)	2.9
Cook Creek	Mouth to Headwaters RM 0 – 2.9	Toxics - Lead	OAR 340-041-0033(2)	2.9
Cook Creek	Mouth to Headwaters RM 0 – 2.9	Toxics - Manganese	OAR 340-041-0033(2)	2.9