

APPENDIX D

**NORTH COAST SUBBASINS
WATER QUALITY MANAGEMENT PLAN**

Water Quality Management Plan (WQMP)

Prepared by: Oregon Department of Environmental Quality
June 2003



State of Oregon
Department of
Environmental
Quality

Planning documents appended for:

- Oregon Dept. of Forestry
- Oregon Dept. of Agriculture
- Oregon Department of Transportation
- Cities/Counties
- Forest Service
- BLM

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CHAPTER 1 - INTRODUCTION

This document is intended to describe strategies for how the North Coast Subbasin Total Maximum Daily Loads (TMDLs) will be implemented and, ultimately, achieved. The main body has been prepared by the Oregon Department of Environmental Quality (DEQ) and includes a description of activities, programs, legal authorities, and other measures for which DEQ and the subbasin’s designated management agencies (DMAs) have regulatory responsibilities. This Water Quality Management Plan (WQMP) is the overall framework describing the management efforts to implement the North Coast Subbasin TMDLs. Appended to this document are DMA-specific Implementation Plans which describe each DMA’s existing or planned efforts to implement their portion of the TMDLs. This relationship is presented schematically in **Figure 1**, below.

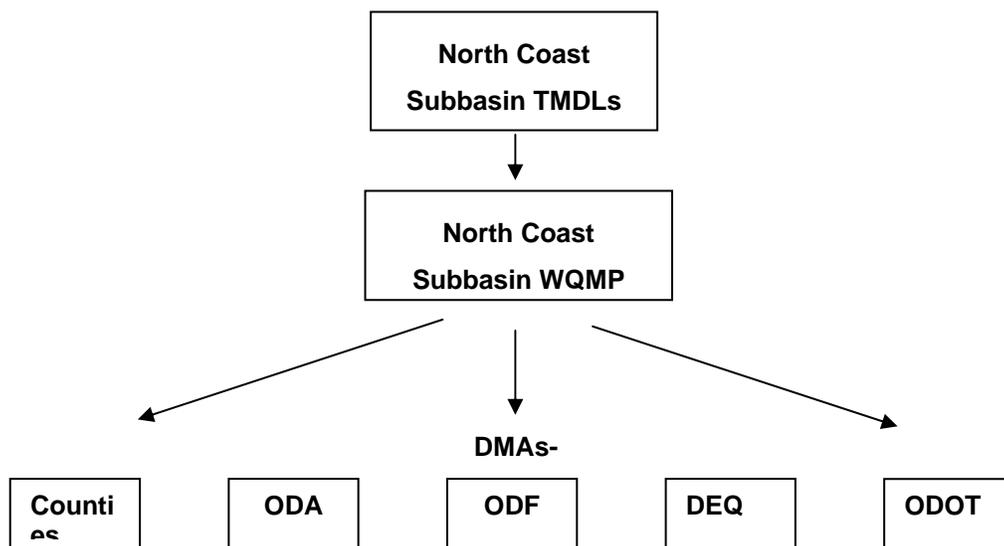


Figure 1 : TMDL/WQMP/Implementation Plan Schematic

The DMAs named in the North Coast 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 iteration of the Implementation Plans are not expected to completely describe management efforts.

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).

This document is the first iteration of the Water Quality Management Plan (WQMP) for the new and revised North Coast Subbasin TMDLs. As explained in “Element 6” of this document, DMA-specific Implementation Plans will be more fully developed once the current TMDLs are submitted to the U. S. Environmental Protection Agency (EPA) and approved. This WQMP will establish proposed timelines (following final TMDL approval) to develop full Implementation Plans. DEQ and the DMAs will work cooperatively in the development of the TMDL Implementation Plans and DEQ will assure that the plans adequately address the elements described below under “TMDL Water Quality Management Plan

Guidance". In short, this document is a starting point and foundation for the WQMP elements being developed by DEQ and North Coast Subbasin DMAs.

Adaptive Management

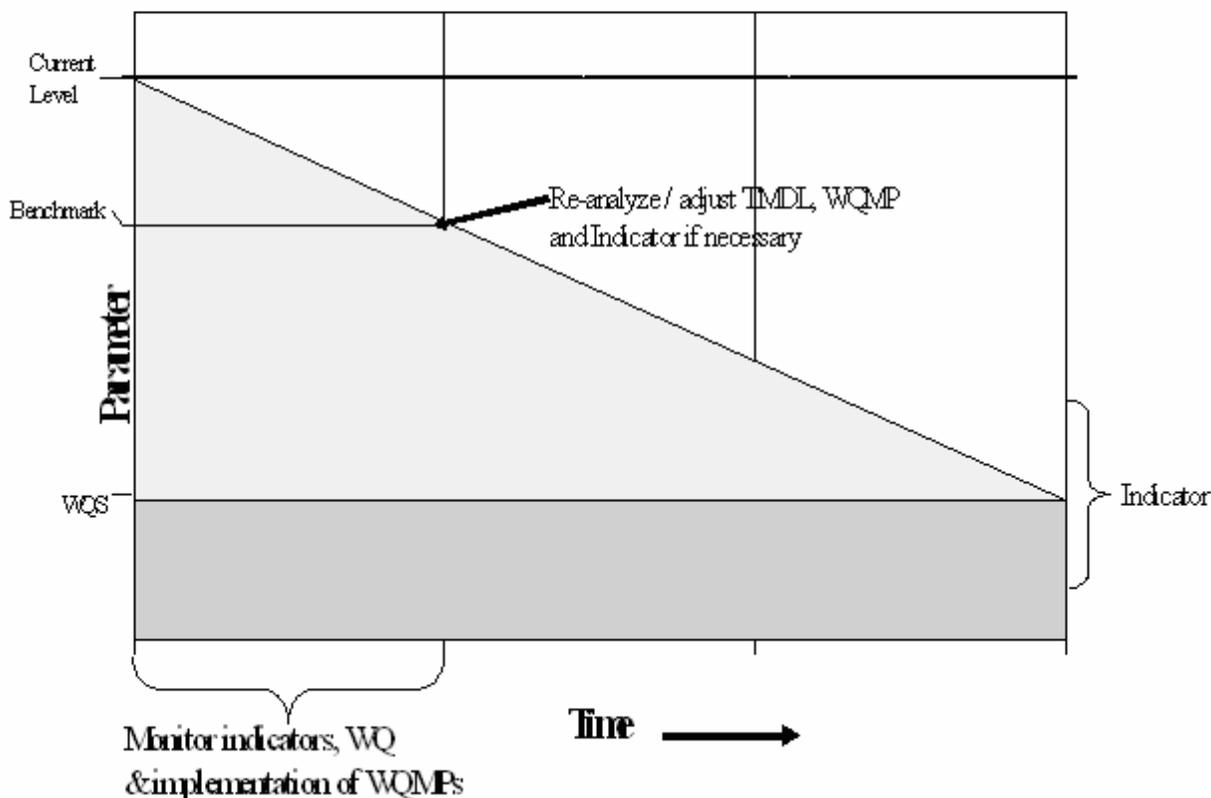
The goal of the Clean Water Act and associated Oregon Administrative Rules (OARs) is that water quality standards shall be met or that all feasible steps will be taken towards achieving the highest quality water attainable. This is a long-term goal in many watersheds, particularly where Nonpoint sources are the main concern. To achieve this goal, implementation must commence 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 the TMDL has 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 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 iterations 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 2 is a graphical representation of this adaptive management concept.

ADAPTIVE MANAGEMENT

(Involves all parties)



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 TMDL and/or its associated surrogates. Such events could be, but are not limited to, floods, fire, insect infestations, and drought.

In the North Coast Subbasins TMDLs, pollutant surrogates have been defined as alternative targets for meeting the TMDLs for some parameters. 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 nonpoint source that is covered by the TMDLs complies with its finalized Implementation Plan or applicable forest practice rules, it will be considered in compliance with the TMDL.

DEQ intends to regularly review progress of this WQMP and the associated Implementation Plans to achieve TMDLs. If and when DEQ determines that the WQMP has been fully implemented, that all feasible management practices have reached maximum expected effectiveness and a TMDL or its interim targets have not been achieved, DEQ shall reopen the TMDL and adjust it or its interim targets and the associated water quality standard(s) as necessary.

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.

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.

In employing an adaptive management approach to the TMDLs and the WQMP, DEQ has the following expectations and intentions:

- 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 TMDL.
- 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 are found to be inadequate, DEQ expects management agencies to revise the components of their Implementation Plan to address these deficiencies.
- When DEQ, in consultation with the DMAs, concludes that all feasible steps have been taken to meet the TMDL and its associated surrogates and attainment of water quality standards, the TMDL, or the associated surrogates is not practicable, it will reopen the TMDL and revise it as appropriate. DEQ would also consider reopening the TMDL should new information become available indicating that the TMDL or its associated surrogates should be modified.

CHAPTER 2 - TMDL WATER QUALITY MANAGEMENT PLAN GUIDANCE

In February 2000, DEQ entered into a Memorandum of Agreement (MOA) with the U.S. Environmental Protection Agency (EPA) that describes the basic elements needed in a TMDL Water Quality Management Plan (WQMP). That MOA was endorsed by the Courts in a Consent Order signed by United States District Judge Michael R. Hogan in July 2000. These elements, as outlined below, will serve as the framework for this WQMP.

WQMP Elements

1. Condition assessment and problem description
2. Goals and objectives
3. Identification of responsible participants
4. Proposed management measures
5. Timeline for implementation
6. Reasonable assurance
7. Monitoring and evaluation
8. Public involvement
9. Costs and funding
10. Citation to legal authorities

This North Coast Subbasins WQMP is organized around these plan elements and is intended to fulfill the requirement for a management plan contained in OAR 340-041-0745.

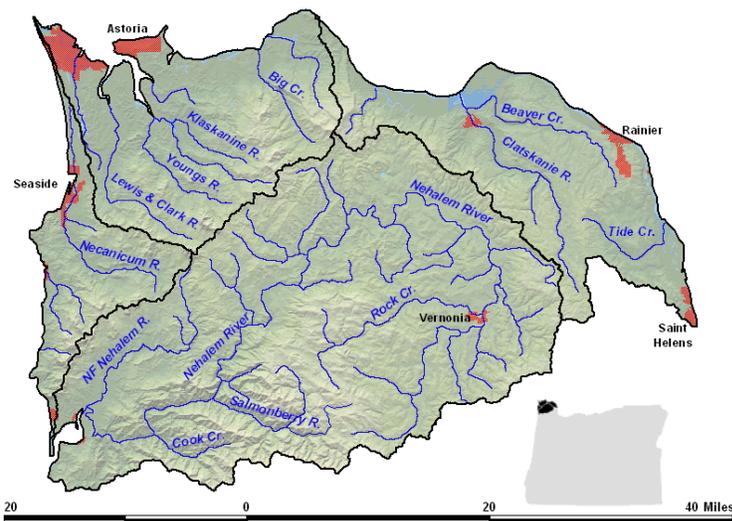
CHAPTER 3 – CONDITION ASSESSMENT AND PROBLEM DESCRIPTION

3.1 GEOGRAPHIC REGION OF INTEREST

The North Coast Subbasins planning area includes the watersheds that drain to the lower Columbia River west of Scapoose (Clatskanie and Young's Bay) and those that drain to the Pacific Ocean from the mouth of Nehalem Bay north (Nehalem and Necanicum Rivers). These subbasins are bounded by the Oregon Coast Range and the Columbia River and Pacific Oceans, and are included in Columbia, Clatsop, Tillamook, and Washington Counties. Together they include approximately 1600 square miles of forestland, low terraces and deltas with a variety of land uses. Though the predominant land use in the area is forest, livestock agriculture is also significant, and urban developments are strung along the coastline at varying densities depending largely on availability of buildable land.

Each of the four subbasins is described below. These descriptions rely heavily on watershed

assessments developed by watershed councils in each of the subbasins. There are additional descriptions for smaller watersheds within these areas, but descriptions here are intended to provide an overview of the basin.



Lower Columbia/Clatskanie River Subbasin (HUC 17080003)

Lower Columbia-Clatskanie Subbasin is located in the northwest corner of Oregon. The Subbasin spans two counties and contains five cities with the largest St. Helens, being partially contained within its boundaries. The subbasin is bounded by the Columbia River to the north, the coast range and Willamette valley to the south. Elevation ranges from sea level along the tidally influenced Columbia River to 3007 feet on the slopes of Nicolai Mountain. The subbasin drains 298

square miles and contains three fifth field watersheds Plympton Creek, Clatskanie River, and Beaver Creek. These fifth field watersheds are based on the Regional Ecosystem Office's 1996 designations. Of these three, the Clatskanie River is the only true watershed, within which all of the streamflow is channeled though a common outlet. The floodplains north of the town of Clatskanie are historic floodplains on the Columbia River that are now cutoff from the river by dikes and levees but still serve as a connection between watersheds.

Population

Developments within the subbasin are mostly rural. The largest city, St. Helens has a population of roughly 9,300 within its city limits (Center for Population Research and Census, 1999). Clatskanie is the second largest at 1,870. Rainier has 1,810, Columbia City 1,665, and Prescott 60.

Lower Columbia/Young's Bay Subbasin (HUC 17080006)

The Youngs Bay watershed is located in the northwest corner of Clatsop County. Youngs Bay is an arm of the Columbia River estuary. It is approximately two miles wide at its confluence with the Columbia River estuary and is situated between the cities of Astoria and Warrenton. The Lewis & Clark River, Youngs River, Klaskanine River, and Wallooskee (Walluski) River flow into Youngs Bay, draining approximately 184 sq. mi. of land (Insert Figure). The Young's River, from its headwaters to the entrance of the Bay, is approximately 17 miles long. The Lewis and Clark River, flowing through state forestry, private forestry, residential communities and farmland empties into Young's Bay and then the Columbia River after 21 miles.

Elevations within the watershed range from sea level at Young's Bay to 3,284 feet (Saddle Mountain) in the southern part of the watershed. The watershed land base is about 160 square miles (~120,000 acres) and represents 24 % of Clatsop County. Over 250 miles of streams and rivers make up the waterways of the Young's Bay Watershed.

The lower reaches of the Lewis and Clark River and Young's River are components of the Columbia River Estuary. The Columbia River Estuary is a nationally-significant estuary, rich in natural resources, supporting some of the largest anadromous fish runs in the world and providing unique habitat for sensitive and endangered species. Past research shows that the Young's Bay Estuary is one of the Lower Columbia's most biodiverse areas. The Young's Bay Watershed also provides several communities with municipal water.

The dominant land use within the Young's Bay Watershed is commercial forestry, since the largest land

owner is Willamette Industries. However, Fort Clatsop National Memorial, a nationally-significant historical site that receives a quarter million visitors per year, is also located in the Watershed.

The Youngs Bay watershed spans portions of three ecoregions (Omernik 1987): the Coastal Lowlands, Coastal Uplands and Willapa Hills ecoregions.

The Coastal Lowland ecoregion occurs in the valley bottoms of the Oregon and Washington coast and is characterized by marine estuaries and terraces with low gradient meandering streams. Channelization and diking of these streams is common. Elevations in this ecoregion run from 0 to 300 ft and the watershed receives 60 to 85 in of annual rainfall. Potential natural vegetation includes Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), red alder (*Alnus rubra*), and estuarine wetland plants (Franklin and Dyrness 1973).

The Coastal Upland ecoregion extends along the Oregon and Washington coast and is typically associated with the upland areas that drain into the coastal lowland ecoregions. The Coastal Upland ecoregion is characterized by coastal upland and headland terraces with medium to high gradient streams. Elevations run from 0 to 500 ft and the watershed receives 70 to 125 in of precipitation. Potential natural vegetation includes Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*) and red alder (*Alnus rubra*; Franklin and Dyrness 1973).

The Willapa Hills ecoregion extends from the southern portion of Clatsop County north to the southern extent of the Puget sound. The Willapa Hills ecoregion is characterized by low rolling hills and mountains with medium gradient streams. Elevations range from 0 to 3,000 feet and the watershed receives 50 to 100 inches of precipitation annually. Potential natural vegetation includes Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), and red alder (*Alnus rubra*; Franklin and Dyrness 1973).

Population

Population in the Youngs Bay Watershed is concentrated in the lower elevations, around the cities of Astoria and Warrenton. Since 1950 the population of Oregon has doubled and the cities of Astoria and Warrenton are predicted to increase in population at a rate of one percent annually (CH2M Hill 1996, 1997). Historically, population growth in Oregon was associated with changes in the natural resource industries. However, recent changes in population have been more associated with in-migration due to quality of life concerns.

Population growth can be attributed to in-migration and is predicted to continue to increase, leading to increased pressures and demands on natural resources such as water supply and water quality.

Necanicum River Subbasin (HUC 17100201)

The Necanicum River flows into the Pacific Ocean and is the first estuary south of the Columbia River on the north coast of Oregon in Clatsop County. The watershed includes the City of Seaside (5860 population). The basin consists primarily of forests (93.6%), cropland (1.2%), rangeland (1.2%), and urban residential (4%). There are approximately 28 tributaries that make up the Necanicum Watershed. The headwaters of the Necanicum begin at river mile 21.2 at which the elevation is 1360 feet. It is estimated that 50% of the marsh area in the Necanicum Estuary has been filled leaving a 278-acre estuary consisting of the Necanicum River, Neawanna Creek, Mill Creek and Neacoxie Creek.

The Necanicum River Watershed is an important resource providing municipal water to the City of Seaside, while also providing many recreational opportunities including fishing, and hunting. The watershed receives on average 100 inches of rainfall a year. However, the area only receives on average 6 inches of rainfall from July through September, a time when water usage is at its highest. Some of the north coast's most productive salmon and trout streams are found in the Necanicum Watershed.

DEQ of Fish and Wildlife consider at least two streams in the watershed core areas for coho salmon (Upper Necanicum, Bergsvick Creek and recent information suggests that Neawanna Creek may also be a core area for coho). Other fish populations include chinook, chum, steelhead, cutthroat trout (resident

and anadromous) and pacific lamprey.

Nehalem River Subbasin (HUC 17100202)

The Nehalem River Watershed is located on the Oregon Coast. It lies completely within the temperate coniferous rain forest belt. Historically, the basin was dominated by old growth coniferous ecosystems with marshlands in the lower gradient areas and estuaries (Kostow, 1995). It is 855 square miles and includes portions of Washington, Columbia, Clatsop, and Tillamook Counties. The Nehalem River is 118.5 miles long and originates on the east side of the Coast Range and circles around the northern tip of the mountains before draining into Nehalem Bay and then the Pacific Ocean. See Figure 1-1 for the watershed location and boundary. There are many large and small tributaries totaling over 935 miles in length. The watershed is divided into six subwatersheds which are used in much of this assessment to summarize findings at a smaller scale (See Figure 1-2).

Watershed elevations range from sea level at the mouth of the Nehalem River to nearly 3,200 feet in the Coast Range near the Salmonberry River. Other distinguishing features include the towns of Nehalem, Mohler and Wheeler concentrated around Nehalem Bay and other small communities scattered through the watershed including Vernonia, Jewell, Birkenfeld, Timber, Mist, and Pittsburg. State Highway 26 runs east and west through the middle of the watershed connecting the watershed communities with Portland.

Population

The Nehalem Watershed is sparsely populated. While there are rural residences in some areas along the mainstem Nehalem River, North Fork Nehalem River and other major tributaries, the only incorporated cities are Nehalem and Vernonia. Nehalem has a population of 200 people and has declined in population since 1990 by 15%. Vernonia has a population of 2,420 and has increased in population since 1990 by 34% (Center for Population Research and Census, 1999).

3.2 BENEFICIAL USES

Oregon Administrative Rules (OAR Chapter 340, Division 41, Table 6) lists the “Beneficial Uses” occurring within the North Coast Subbasins (**Table 1**). Numeric and narrative water quality standards are designed to protect the most sensitive beneficial uses.

Table 1. Beneficial uses occurring in the North Coast Subbasins (OAR 340 – 41 – 0442)			
<i>Beneficial Use</i>	<i>Occurring</i>	<i>Beneficial Use</i>	<i>Occurring</i>
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	✓		

3.3 CURRENT CONDITIONS

Water Quality Limited Status and TMDLs

Many waterbodies in the North Coast Subbasins are impaired for one or more water quality parameters (**Table 1**). Water quality limited status is determined through assessment of water quality through sampling and comparison of results to established water quality standards. These standards have been adopted by the State of Oregon to protect specified beneficial uses. Both the beneficial uses and the standards are published in the Oregon Administrative Rules (OAR) at section 340-041.

Waterbodies that do not meet water quality standards for any water quality parameter are periodically compiled into a list that the state submits to the US Environmental Protection Agency. This “303(d) list (named after the section of the federal Clean Water Act that requires it) is the basis for prioritizing development of total maximum daily loads for a basin. TMDLs are required under section 303(d) and are limits on the amount (“load”) of a pollutant that may enter a waterbody in combination from all sources. The 1998 303(d) list approved by EPA included 15 listings (Table 1) for waterbodies impaired by excessive temperature (2), elevated bacterial concentrations (4), depressed dissolved oxygen concentrations (4), noxious weeds in lakes (4), and biocriteria (1). More recent data have demonstrated other waterbodies are also water quality limited, and the North Coast Subbasins TMDL is addressing waterbodies throughout the subbasin, including those on both the 1998 and 2002 lists. The current TMDL and WQMP are focused only on temperature and bacteria. Dissolved oxygen and noxious weeds will be included in separate TMDLs in the near future. Biocriteria listings are based on integrative measures indicating pollution, and do not require TMDLs. TMDLs developed for other parameters in the basin are expected to result in improvements in biocriteria.

Table 1. Water bodies in the North Coast Subbasins listed under section 303(d) of CWA as water quality limited due to temperature, bacteria or biocriteria (DEQ 2003)

Waterbody	River Mile	Parameter	Season	Criterion	Year Listed
Lower Columbia/Clatskanie Subbasin					
Beaver Creek	0 to 14	Temperature	Summer	Rearing: 17.8 C	2002
Clatskanie River	0 to 1.9	Fecal Coliform	Summer	Mean of 200 MPN	1998
Clatskanie River	0 to 1.9	Temperature	Summer	Rearing: 17.8 C	2002
Clatskanie River	1.9 to 25.5	Temperature	Summer	Rearing: 17.8 C	2002
Clatskanie River	1.9 to 25.5	Temperature	September 15	Spawning: 12.8 C	2002
Little Clatskanie River	0 to 6.2	Temperature	Summer	Rearing: 17.8 C	2002
South Fork Goble Cr.	0 to 3.9	Bio Criteria	Year Round	Waters of the stat	1998
Tide Creek	0 to 16.1	Temperature	September 15	Spawning: 12.8 C	2002
Lower Columbia/Young's Subbasin					
Bear Creek	2.5 to 9	Temperature	Summer	Rearing: 17.8 C	2002
Bear Creek	2.5 to 9	Temperature	September 15	Spawning: 12.8 C	2002
Gnat Creek	0 to 9.8	Temperature	September 15	Spawning: 12.8 C	2002
Lewis And Clark River	8.6 to 10.8	Temperature	Summer	Rearing: 17.8 C	2002
Youngs River	9 to 23.2	Temperature	Summer	Rearing: 17.8 C	2002
Necanicum Subbasin					
Necanicum River	0 to 5.9	E Coli	Summer	Mean of 126 MPN	2002
Necanicum River	0 to 20.6	Temperature	September 15	Spawning: 12.8 C	2002
Necanicum River	0 to 15	Temperature	Summer	Rearing: 17.8 C	2002
Pacific Ocean	26 to 30	Fecal Coliform	Year Around	Median 14 MPN	2002
Nehalem Subbasin					
Beneke Creek	0 to 10.1	Temperature	Summer	Rearing: 17.8 C	2002
Buster Creek	0 to 9.1	Temperature	September 15	Spawning: 12.8 C	2002
Cook Creek	0 to 9.3	Temperature	September 15	Spawning: 12.8 C	2002
Cronin Creek	0 to 1.8	Temperature	September 15	Spawning: 12.8 C	2002
East Fork Nehalem R.	0 to 9.8	Temperature	Summer	Rearing: 17.8 C	2002
East Humbug Creek	0 to 4.5	Temperature	September 15	Spawning: 12.8 C	2002
Fishhawk Creek	0 to 11.9	Temperature	Summer	Rearing: 17.8 C	2002
Fishhawk Creek	0 to 11.9	Temperature	September 15	Spawning: 12.8 C	2002
Fishhawk Creek	0 to 7.8	Temperature	Summer	Rearing: 17.8 C	2002
Fishhawk Creek	0 to 7.8	Temperature	September 15	Spawning: 12.8 C	2002
Foley Creek	0 to 3.7	Temperature	Summer	Rearing: 17.8 C	2002
Gods Valley Creek	0 to 4.8	Temperature	September 15	Spawning: 12.8 C	2002
Humbug Creek	0 to 6.5	Temperature	Summer	Rearing: 17.8 C	2002
Humbug Creek	0 to 6.5	Temperature	September 15	Rearing: 17.8 C	2002
Nehalem River	0 to 14.7	Temperature	Summer	Rearing: 17.8 C	1998
Nehalem River	14.7 to 92.	Temperature	Summer	Rearing: 17.8 C	1998
Nehalem River	14.7 to 92.	Temperature	September 15	Spawning: 12.8 C	2002
Nehalem River	92.4 to 108	Temperature	Summer	Rearing: 17.8 C	2002
Nehalem River	92.4 to 108	Temperature	September 15	Spawning: 12.8 C	2002
Nehalem River	108 to 120	Temperature	September 15	Spawning: 12.8 C	2002
North Fork Nehalem R.	10.5 to 23.	Temperature	Summer	Rearing: 17.8 C	2002
North Fork Nehalem R.	10.5 to 23.	Temperature	September 15	Spawning: 12.8 C	2002
Northrup Creek	0 to 7.5	Temperature	Summer	Rearing: 17.8 C	2002
Northrup Creek	0 to 7.5	Temperature	September 15	Spawning: 12.8 C	2002
Oak Ranch Creek	0 to 9.3	Temperature	Summer	Rearing: 17.8 C	2002

Waterbody	River Mile	Parameter	Season	Criterion	Year Listed
Oak Ranch Creek	0 to 9.3	Temperature	September 15	Spawning: 12.8 C	2002
Pebble Creek	0 to 9.8	Temperature	Summer	Rearing: 17.8 C	2002
Pebble Creek	0 to 9.8	Temperature	September 15	Spawning: 12.8 C	2002
Rock Creek	0 to 11	Temperature	Summer	Rearing: 17.8 C	2002
Rock Creek	0 to 11	Temperature	September 15	Spawning: 12.8 C	2002
Salmonberry River	0 to 5	Temperature	Summer	Rearing: 17.8 C	2002
Salmonberry River	0 to 5	Temperature	September 15	Spawning: 12.8 C	2002
Soapstone Creek	0 to 3.9	Temperature	Summer	Rearing: 17.8 C	2002
Walker Creek	0 to 10	Temperature	Summer	Rearing: 17.8 C	2002
Walker Creek	0 to 10	Temperature	September 15	Spawning: 12.8 C	2002
West Humbug Creek	0 to 5.1	Temperature	September 15	Spawning: 12.8 C	2002
Wolf Creek	0 to 7.8	Temperature	September 15	Spawning: 12.8 C	2002
Nehalem Bay	0 to 2.1	Fecal Coliform		Median 14 MPN	1998
Nehalem Bay	0 to 4.1	Fecal Coliform		Median 14 MPN	1998

3.4 EXISTING SOURCES OF WATER POLLUTANTS

Sources of pollutants are categorized between point source discharges and nonpoint source discharges. Point sources and the likely TMDL pollutants they discharge are listed in Table 2. Both point and nonpoint sources are described in the following subsections.

Table 2. Point source dischargers and likely pollutants discharged.

Facility ID	Legal Name (Common Name)	Permit Type	Nearest City	Receiving Waterbody	River Mile	Pollutants Possible
29850/A	Fishhawk Lake Recreation Club, INC.	NPDES	Birkenfeld	Fishhawk Creek (to Nehalem River) ¹	3.8 (66)	Temperature Bacteria
61787/A	Nehalem Bay Wastewater Agency	NPDES	Nehalem	Nehalem River (Bay) ¹	2	Temperature Bacteria
92773/A	City of Vernonia	NPDES	Vernonia	Nehalem River ¹	90.3	Temperature Bacteria
64485/A	ODFW – NF Nehalem Fish Hatchery	GEN03	Nehalem	North Fork Nehalem River ¹	10.5	Temperature
3300/A	Arch Cape Service District	NPDES	Arch Cape	Arch Cape Creek ²	0.5	Temperature Bacteria
13729/A	City of Cannon Beach	NPDES	Cannon Beach	Ecola Creek ²	0	Temperature Bacteria
79929/A	City of Seaside	NPDES	Seaside	Necanicum River ¹	0.2	Temperature Bacteria
88436/B	Henke, Harry III (River Point Homeowners)	NPDES	Astoria	Young's River (Bay) ²	2	Temperature Bacteria
81118/A	Shoreline Sanitary District	NPDES	Warrenton	Skipanon River ²	8	Temperature Bacteria
64485/A	ODFW – Klaskanine Fish Hatchery	GEN03	Astoria	Klaskanine River (to Young's River) ²	4.6 (10.3)	Temperature
16872/A	City of Clatskanie	NPDES	Clatskanie	Clatskanie River ¹	1.1	Temperature Bacteria

¹= listed for bacteria or flows to a listed reach.

²= not listed for bacteria and does not flow to a listed reach.

3.4.1 Bacteria

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

1. Wastewater Treatment Plants and Sanitary Sewer Systems

There are nine wastewater treatment plants (WWTP) in the subbasins: Generally, bacteria concentrations discharged by each of the plants is well below the permit limits 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. Records will be reviewed to determine their number, extent and impacts.

2. Cross connections

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

3. Permitted Sites other than WWTPs

Discharges from other permitted sites (industrial, etc.) may contain bacteria in either stormwater or direct discharges. These permits will be reviewed to determine this potential.

4. Direct Deposition

Bacteria may be directly deposited into surface waters by birds and other animals. This is most evident in ponds where high temperatures, low velocities and high bird densities often result in elevated bacteria concentrations.

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 stormwater sampling points to urban runoff as a significant source of bacteria in surface waters. The ultimate sources of this 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 possible exception of sanitary sewers. Additional potential sources are "hobby" farms, livestock (cows, horses, etc.) 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.

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).

3.4.2 Temperature

Surface water temperatures in North Coast Subbasins 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 an 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 anthropogenic sources may result from the following conditions within the North Coast Subbasins:

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 from wastewater treatment plants, fish hatcheries and reservoirs, and
4. Disconnected floodplains which prevent/reduce groundwater discharge into the river.

CHAPTER 4 – 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 North Coast Subbasins. Specifically the WQMP combines a description of all Designated Responsible Participants (or 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 is gained regarding the pollutants, allocations, management measures, and other related areas.

The expectation of all DMAs are to:

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

CHAPTER 5 - 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 North Coast Subbasins. 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 subbasins. We are all contributors to the existing quality of the waters in the North Coast Subbasins and we all must be participants in the efforts to improve water quality.

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 SUBBASIN 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
- Following standards and Guidance listed in PACFISH

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Fishhawk Lake Recreation Club, Inc., Nehalem Bay Wastewater Agency, City of Vernonia, Arch Cape Service District, City of Cannon Beach, City of Seaside, Henke, Harry III (River Point Homeowners), Shoreline Sanitary District, City of Clatskanie, George N. Lammi (Lammi Sand And Rock Products), Westport Sewer Service District

- Construction, operation and maintenance of wastewater treatment plants and sanitary sewer system
- Operation of a reservoir on Fishhawk Creek (Fishhawk Lake Recreation Club, Inc.)

Cities of Wheeler, Nehalem, Manzanita, Cannon Beach, Seaside, Gearhart, Warrenton, Astoria, Clatskanie, Rainier, Prescott, Columbia City, St. Helens, Scapoose, Vernonia

- Construction, operation, and maintenance of the municipal separate storm sewer system within the city limits.
- Land use planning/permitting
- Maintenance, construction and operation of parks and other city owned facilities and infrastructure
- Riparian area management

Clatsop, Columbia, Tillamook, and Washington Counties

- 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
- Inspection and permitting of septic systems
- Riparian area management

Table 3. North Coast Subbasins 303d listed stream segments along with the responsible Designated Management Agencies are defined in Table 2, below.

Waterbody	River Mile	Designated Management Agencies
Clatskanie River	0 to 1.9	Col, ODF, ODOT, ODA, City of Clatskanie
Beaver Creek	0 to 14	Col, ODF, ODOT, ODA
Clatskanie River	0 to 1.9	
Clatskanie River	1.9 to 25.5	
Clatskanie River	1.9 to 25.5	
Little Clatskanie River	0 to 6.2	
Tide Creek	0 to 16.1	
South Fork Goble Cr.	0 to 3.9	
Bear Creek	2.5 to 9	Clats, ODF, ODOT, ODA
Bear Creek	2.5 to 9	
Gnat Creek	0 to 9.8	
Lewis And Clark River	8.6 to 10.8	
Youngs River	9 to 23.2	
Necanicum River	0 to 5.9	
Pacific Ocean	26 to 30	Clats, ODOT, ODA, ODFW, City of Seaside
Necanicum River	0 to 20.6	Clats, ODOT, ODA
Necanicum River	0 to 15	
Nehalem Bay	0 to 2.1	Clats, ODOT, ODA, ODFW, City of Nehalem
Nehalem Bay	0 to 4.1	

Beneke Creek	0 to 10.1	Clats, Col, Till, Wash, ODF, ODOT, ODA
Buster Creek	0 to 9.1	
Cook Creek	0 to 9.3	
Cronin Creek	0 to 1.8	
East Fork Nehalem R.	0 to 9.8	
East Humbug Creek	0 to 4.5	
Fishhawk Creek	0 to 11.9	Clats, Col, Till, Wash, ODF, ODOT, ODA, Fishhawk Lake Recreation Club, Inc.
Fishhawk Creek	0 to 11.9	
Fishhawk Creek	0 to 7.8	
Fishhawk Creek	0 to 7.8	
Foley Creek	0 to 3.7	Clats, Col, Till, Wash, ODF, ODOT, ODA
Gods Valley Creek	0 to 4.8	
Humbug Creek	0 to 6.5	
Humbug Creek	0 to 6.5	
Nehalem River	0 to 14.7	Clats, Col, Till, Wash, ODF, ODOT, ODA, City of Vernonia
Nehalem River	14.7 to 92.	
Nehalem River	14.7 to 92.	
Nehalem River	92.4 to 108	
Nehalem River	92.4 to 108	
Nehalem River	108 to 120	Clats, Col, Till, Wash, ODF, ODOT, ODA, ODFW
North Fork Nehalem R.	10.5 to 23.	
North Fork Nehalem R.	10.5 to 23.	Clats, Col, Till, Wash, ODF, ODOT, ODA
Northrup Creek	0 to 7.5	
Northrup Creek	0 to 7.5	
Oak Ranch Creek	0 to 9.3	
Oak Ranch Creek	0 to 9.3	
Pebble Creek	0 to 9.8	
Pebble Creek	0 to 9.8	Clats, Col, Till, Wash, ODF, ODOT, ODA, City of Vernonia
Rock Creek	0 to 11	
Rock Creek	0 to 11	Clats, Col, Till, Wash, ODF, ODOT, ODA
Salmonberry River	0 to 5	
Salmonberry River	0 to 5	
Soapstone Creek	0 to 3.9	
Walker Creek	0 to 10	
Walker Creek	0 to 10	
West Humbug Creek	0 to 5.1	
Wolf Creek	0 to 7.8	

*Notes: Clats = Clatsop Co. Col = Columbia Co. Till = Tillamook Co. Wash = Washington Co. ODA= Oregon Dept. of Agriculture
ODF = Oregon Dept. of Forestry ODOT = Oregon Dept. of Transportation

CHAPTER 6 – PROPOSED MANAGEMENT MEASURES

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.

Wastewater Treatment Plants

The wasteload allocations given to the 9 wastewater treatment plants (WWTPs); Fishhawk Lake Recreation Club, Inc., Nehalem Bay Wastewater Agency, City of Vernonia, Arch Cape Service District, City of Cannon Beach, City of Seaside, Shoreline Sanitary District, City of Clatskanie and, River Point Homeowners will be implemented through modifications to their National Pollutant Discharge Elimination System (NPDES) permits. These permits will either include numeric effluent limits or provisions to develop and implement management plans, whichever is appropriate.

General and Minor Individual NPDES Permitted Sources

All general NPDES permits and minor individual NPDES permits will be reviewed and, if necessary, modified to ensure compliance with allocations. Specific management measures and plans will be developed of these permitted sources.

The North Fork Nehalem Fish Hatchery has a specific allocation for temperature in the TMDL. This facility is required under the conditions of the new general permit for hatchery operations to characterize its effluent. Once the effluent is characterized relative to temperature, a temperature management plan will be developed to ensure compliance with water quality standards.

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 4** 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 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 measures 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 contributions.

Detention of water in Fishhawk Lake causes both an increase in temperature and a 1 to 2-day delay in transit of water from the creek upstream to the creek downstream. Controlled releases of water from the dam have been successful at lowering water temperatures downstream of the dam, but these controlled releases were limited to a short-term study (Joe Sheahan, ODFW data). Dissolved oxygen concentrations in bottom waters near the dam are typically quite low and would likely cause an impairment if released without some type of oxygenating process (e.g., release through a Howell-Bunger valve).

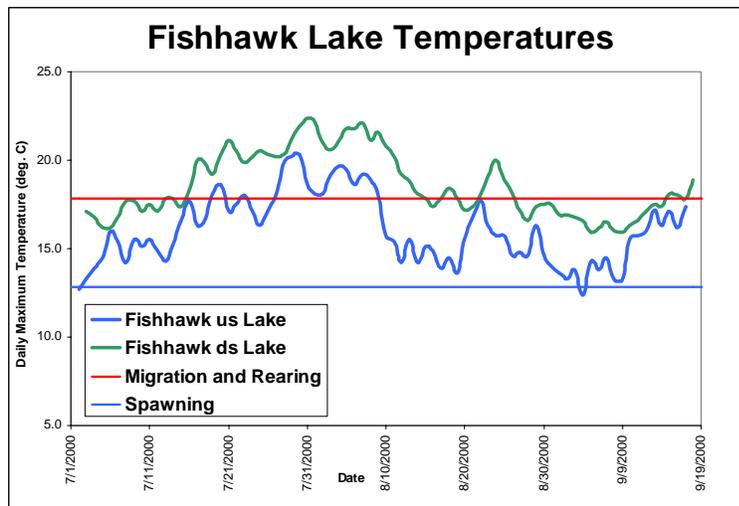


Figure 1.
Temperature profiles upstream and downstream of Fishhawk Lake during summer months.

The Fishhawk Lake Recreation Club will be required to develop a temperature management plan to minimize the heat loading to Fishhawk Creek resulting from the operation of Fishhawk Lake. Controlled release of bottom water has been demonstrated as effective in lowering downstream temperatures (Joe Sheahan, ODFW data).

Table 4. Management categories sorted by pollutant source and/or management measures

Management Measure/Source Category	Standard/Parameter	
	Bacteria	Temperature
Public Awareness/Education	X	X
New Development and Construction		
Planning Procedures	X	X
Permitting/Design	X	X
Education and Outreach	X	X
Construction Control Activities	X	X
Inspection/Enforcement		
Post-Construction Control	X	X
Procedures/Measures		
Storm Drain System Construct.	X	X
Existing Development		
Storm Drain System	X	
O&M	X	
Retrofit	X	
Streets & Roads		
Maintenance Activities	X	
Septic Systems	X	
Procedures/Measures	X	X
Inspection/Enforcement	X	
Parking Lots	X	
Commercial and Industrial Facilities	X	X
Source Control	X	X
Fertilizers		
Pet Waste	X	
Illicit Connections and Illegal Dumping	X	
Residential		
Illegal Dumping	X	
Illicit Discharges and Cross Connections	X	
Commercial and Industrial	X	
Illegal Dumping	X	
Illicit Discharges and Cross Connections	X	
Riparian Area Management	X	X

Rural/Urban Residential Riparian Protection/Enhancement	X	X
Streambank Stabilization	X	X
Public/Governmental Facilities		
Parks	X	X
Public Waterbodies (Ponds, etc.)	X	X
Municipal Corporation Yard O&M	X	
Other Public Buildings and Facilities	X	X
Forest Practices		
Implement Forest Protection Act (State)		X
Implement National Forest Lands & Resource Management Plans (Federal)		X
Riparian Protection/Enhancement		X
Replace/Restore Roads/Culverts		X
Agricultural Practices		
Implement SB 1010 AgWQMP	X	X
Livestock Management Training	X	X
Nutrient Management Plans	X	
Riparian Protection/Enhancement	X	X
Wetland Protection/Enhancement	X	X
Reconnect Sloughs and Rivers	X	X
Replace Defective Tidegates/Culverts	X	X
Setback Levies & Dikes	X	X
CAFO Implementation	X	X
Planning and Assessment		
Source Assessment/Identification	X	X
Source Control Planning	X	X
Monitoring and Evaluation		
BMP Monitoring and Evaluation	X	X
Instream Monitoring	X	X
BMP Implementation Monitoring	X	X
Transportation		
Road Construct., Maintenance, Repair	X	X

CHAPTER 7 – 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 iterations to develop effective techniques.

For some North Coast Subbasins 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 subbasin or its 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.

Figure 2, below, gives the timeline for activities related to the WQMP and associated DMA Implementation Plans.

Figure 2: Water Quality Management Plan Timeline

Activity	2003	2004	2005	2006	2007
DEQ Modification of WWTP Permits					
DEQ Modification of General and Minor Permits					
DMA Development and Submittal of Implementation and Monitoring Plans ¹					
DMA Implementation of Plans					
DEQ/DMA/Public Review of TMDL and WQMP					
DMA Submittal of Annual Reports	To Be Arranged ²				

¹ Existing Implementation plans for several of the major DMAs are appended to this document.

² As appropriate by DMA; generally annual or biennial; see Monitoring and Evaluation, Chapter 9.

Estimate of Time to Meet Water Quality Standards

Estimates of time for meeting standards and full protection of beneficial uses were made based on existing plans (bacteria) and estimates of vegetational growth (temperature) and are listed below. Bacteria estimates are based on the timeline above (Timeline for Implementation). Temperature and channel morphology improvements are dependent on growth of riparian vegetation (see Temperature Technical Appendix of TMDL –Section 3.5.3) and other management actions. The longest-term treatment is restoration of riparian vegetation where needed to provide system potential shade. Vegetation should stabilize streambanks sooner than it will provide system potential shade, though restoration of channels will be an ongoing process. Time scales are approximate and implementation will occur as specific plans are implemented or developed and as funding becomes available. Specific estimates for implementation are:

Bacteria:

Achieve water quality standards in the rivers and Bays/Estuaries by 2010.

Temperature:

Milestone 1; Measurable increases in instream shade by 2020

Milestone 2; Achieve instream temperatures that meet salmonid requirements by 2050

CHAPTER 8 – 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. Many of these programs were developed in response to the phosphorus and ammonia TMDLs developed in 1988. Some of these are traditional regulatory programs such as specific requirements under NPDES discharge permits. Other programs address Nonpoint sources under the auspices of state law (for forested and agricultural lands) and voluntary efforts.

Point Sources

Reasonable assurance that implementation of the point source wasteload allocations will occur will be addressed through the revision, issuance or revision of NPDES and WPCF permits.

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 the EPA. The WPCF permit is unique to the State of Oregon. As the permits are renewed, they will be revised to insure that all 303(d) related issues are addressed in the permit. These permit activities assure that elements of the TMDL 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 the 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.

The NPDES permits for the 8 wastewater treatment plants with wasteload allocations, will be revised to address the WLAs. All general and minor NPDES permits within the subbasin will also be revised to address the appropriate WLAs.

NONPOINT SOURCES

NON FEDERAL FOREST LANDS

The Oregon Department of Forestry (ODF) is the designated management agency for regulation of water quality on non-federal forestlands. 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, Nonpoint 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 DEQ through a memorandum of understanding (MOU) signed in April of 1998. This MOU was designed to improve the coordination between the ODF and the DEQ 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 DEQ 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:

- 1) Temperature
- 2) Sediment
- 3) Turbidity
- 4) Aquatic habitat modification
- 5) 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 1 (detailed description of the management of non-federal forest lands portion under the Forest Practices Act).

The final Sufficiency Analysis is available for viewing at:
<http://www.deq.state.or.us/wq/nonpoint/nonpoint.htm>

ODF has plans specific to the management of state forests. The [Northwest Oregon State Forests Management Plan](#) was approved in January 2001, and covers management of about 615,000 acres of mostly young forests in western Oregon. In the North Coast Basin, the plan guides activities on the Tillamook and Clatsop state forests, as well as scattered forestlands in many western Oregon counties. In general, these plans have more restrictive harvest management requirements than the FPA.

FEDERAL FOREST LANDS

Federal forest lands are managed by the US Forest Service (USFS) and the Bureau of Land Management (BLM). Very little of the area covered by this WQMP are managed by federal agencies. All management activities on federal lands managed by the U.S. Forest Service (USFS) and the Bureau of Land Management must follow Aquatic Conservation Strategy standards and guidelines (S&Gs) as listed in the respective Land Use and Management Plans (LRMPs), as amended, for the specific land management units. The Standards and Guidelines for the Aquatic Conservation Strategy contain four components: riparian reserves; key watersheds; watershed analysis; and watershed restoration. Each part is expected to play an important role in improving the health of the region's aquatic ecosystems. The management goals of the Northern Coast Range Adaptive Management Area are restoration and maintenance of late-successional forest and the conservation of fisheries habitat and biological diversity.

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 maintaining 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.

AGRICULTURE

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 evaluate the AWQMAP to assure attainment of DEQ's load allocations for agriculture. 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 North Coast Subbasins.

Appendix 2 includes the Agricultural Water Quality Management plan for the North Coast Subbasin.

OREGON DEPARTMENT OF TRANSPORTATION

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:

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.

COUNTIES: URBAN AND RURAL SOURCES

Oregon cities and counties have authority to regulate land use activities through local comprehensive plans and related development regulations. This authority begins with a broad charge given to them by the Oregon constitution and the Oregon legislature to protect the public's health, safety, and general welfare.

Every city and county is required to have a comprehensive plan and accompanying development ordinances to be in compliance with state land use planning goals. While the comprehensive plan must serve to implement the statewide planning goals mandated by state law, cities and counties have a wide degree of local control over how resource protection is addressed in their community.

The Oregon land use planning system provides a unique opportunity for local jurisdictions to address water quality protection and enhancement. Many of the goals have a direct connection to water quality, particularly Goals 5 and 6. Columbia County has published a final draft of Proposed Amendments to the Comprehensive Plan for Goal 5, and Clatsop and Tillamook Counties are also currently in the process of conducting Periodic Reviews of their comprehensive plans. Among the expected changes to these plans will be revised ordinances for the protection of riparian areas. We expect the counties to adopt revised ordinances that will be sufficient to meet the allocations in the TMDL.

ALL RESPONSIBLE PARTIES

Responsible participants for implementing DMA specific water quality management plans for urban and rural sources were identified in Chapter 5 of this Water Quality Management Plan. Upon approval of the North Coast Subbasin TMDLs, it is DEQ's expectation that identified, responsible participants will develop, submit to DEQ, and implement individual water quality management 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 Chapter 7 of this Water Quality Management Plan. The DMA specific water quality management plans must address the following items:

- 1) Proposed management measures tied to attainment of the load allocations and/or established surrogates of the TMDLs, such as vegetative site potential for example.

- 2) Timeline for implementation.
- 3) Timeline for attainment of load allocations.
- 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 participants responsible for implementation of monitoring, and a plan and schedule for revision of implementation plan.
- 7) Public involvement.
- 8) Maintenance effort over time.
- 9) Discussion of cost and funding.
- 10) Citation of legal authority under which the implementation will be conducted.

Several of the DMAs have existing implementation plans that will suffice for implementing the WQMP. Should any responsible participant fail to comply with their obligations under this WQMP, DEQ 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.

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 Plan consists of four essential elements:

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 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.

Voluntary Measures

There are many voluntary, non-regulatory, watershed improvement programs (Actions) that are in place and are addressing water quality concerns in the North Coast Subbasins. 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 North Coast Subbasins. 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 subbasin. 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 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).

LOWER COLUMBIA RIVER ESTUARY PARTNERSHIP (MODIFIED FROM LCREP WEBSITE)

The Lower Columbia River became part of the National Estuary Program in 1995. The Lower Columbia River Estuary Partnership is a two-state, public-private initiative. It is implementing a comprehensive management plan for the 146 miles of the lower Columbia River and estuary. It has a strong record of bringing diverse interests together to reach consensus in the best interests of this complex river system. Using a watershed approach, the Estuary Partnership cuts across political boundaries, integrating 28 cities, 9 counties, and the states of Oregon and Washington.

The Comprehensive Conservation and Management Plan (CCMP) serves as the strategic plan for the Lower Columbia River Estuary Partnership. It guides all program activities and annual work tasks for the Partnership. Developing and implementing a Comprehensive Conservation and Management Plan is the primary task of a National Estuary Program. Although many of the actions listed in the plan address issues other than temperature and bacteria, its unified approach to restoration and protection will help address these parameters as well.

The Management Plan embodies the efforts of many committed citizens who represent

environmental groups, local governments, state and federal agencies, ports, tribal governments, industry, labor, agriculture, recreational users, commercial fishing, the regional Northwest Power Planning Council, and citizens-at-large. In keeping with the Estuary Program's emphasis on a collaborative local decision-making process, extensive public outreach and involvement opportunities have been used in developing the Management Plan.

A Policy Committee and Management Committee led the effort to develop the Management Plan for the Lower Columbia River. The Management Committee itself represented broad and diverse issues and perspectives. They worked to identify priority issues, then specify actions to address the priority issues, and finally, define how to implement those actions. The Comprehensive Conservation and Management Plan is the result of this 3-year effort to define what the river needed. A innovative tool used by the Management Committee to define actions was the comparative risk ranking. It integrated science and public concern and helped define specific actions.

Management Plan Goals

- Increase habitat and habitat functions
- Prevent toxic and conventional pollution
- Improve land use practices to protect ecosystems
- Monitor the river for long term and evaluate impact of actions
- Strengthen coordination between the states in water quality and species issues
- Enhance education opportunities about the lower river and estuary to build stewardship among all citizens: individual, municipal, corporate

Management Plan Actions

On-The-Ground Improvements for Habitat and Land Use

- Restore 16,000 acres of wetlands in the study area
- Inventory and classify habitat and identify critical habitat for protection
- Change land use practices to ensure that development is environmentally sensitive
- Limit non-water dependent development in the floodway
- Maintain natural buffers on riparian corridors
- Reduce the quantity of stormwater runoff and improving its quality
- Use best management practices to control runoff and limit conventional or toxic pollutants

Twelve actions address habitat loss and modification and the impacts of land use activities. In the comparative risk ranking conducted in 1997, all three participating groups (technical experts, focus groups, and the general public) ranked loss of habitat and wetlands as the number one risk to public health, ecological health, and quality of life in the lower river and estuary. The Estuary Partnership will initiate these activities and assist others as well.

Heightened Education and Information and Government Coordination

- Initiate and sustain long term monitoring that builds on existing agency monitoring activities
- Centralized comprehensive data to measure effectiveness of actions taken
- Define a common purpose and establish a commitment to that purpose among all interests to advance regional well-being
- Provide education and information to all citizens, including opportunities to experience the river and its connections to our behaviors
- Improve coordination among government agencies
- Administer grant Partnership
- Coordinate volunteer monitoring and involvement
- Help local governments implement federal, state, and local environmental and land use laws

Over 160 agencies of government currently has some management or regulatory role on the lower Columbia River. The Management Plan also recognizes that accurate, objective information for all ages is key to fostering stewardship for the river among all citizens. Fifteen actions call for increased education and improved consistency and coordination among government agencies with responsibility for the lower river and estuary. These actions are seen as paramount for fostering public stewardship and effectively protecting the resource. Long term monitoring is a key component of the education efforts. The Estuary Partnership will take the lead in implementing these actions.

Reduction of Toxic and Conventional Pollutants

- Eliminate persistent bioaccumulative toxics
- Establish maximum daily loads for streams that do not meet water quality standards
- Reduce PAHs and heavy metal discharges associated with petroleum powered vehicles and equipment
- Reduce bacterial contamination

The sixteen actions that address conventional and toxic pollutants involve the regulatory authority of a variety of local, state, and federal agencies. Some actions reflect existing activities, some call for increased activity. The Estuary Partnership's primary role will be to monitor the progress of the responsible entities to ensure the actions are implemented and the goals are met. Implementation of the plan is on-going. Some actions are one time activities; most require a long term sustained effort.

CHAPTER 9 – MONITORING AND EVALUATION

Monitoring and evaluation has two components: 1; implementation of DMA-specific water quality management plans identified in this document, and 2; Physical, chemical and biological parameters for water quality and specific management measures. This information will be used to assess progress toward achieving TMDL allocations and water quality standards, and for evaluation of progress as described under Adaptive Management in Chapter 1: Introduction.

The information generated by each of the agencies/entities gathering data in the North Coast Subbasins will be pooled and used by DEQ to determine whether management actions are having the desired effects or if changes in management actions and/or TMDLs are needed. This detailed evaluation will typically occur on a 5 year cycle. If progress is not occurring then the appropriate management agency will be contacted with a request for action.

The objectives of this monitoring effort are to demonstrate long-term recovery, better understand natural variability, track implementation of projects and BMPs, and track effectiveness of TMDL implementation. This monitoring and feedback mechanism is a major component of the “reasonable assurance of implementation” for the North Coast Subbasins TMDL WQMP

Performance of this WQMP and the DMA-specific Implementation Plans will be tracked by accounting for the numbers, types, and locations of projects, BMPs, educational activities, or other actions taken to improve or protect water quality. The mechanism for tracking DMA implementation efforts will be through reports to be submitted by the DMAs.

The source of information on implementation and water quality improvements will be a combination of DEQ and other DMA monitoring as described below.

Department of Environmental Quality

The DEQ Laboratory conducts ongoing water quality monitoring throughout the state and at several scales. Ambient water quality monitoring provides an assessment of statewide water quality trends through time by sampling at 151 fixed stations. Volunteer monitoring is conducted through the organized support of over 40 watershed councils throughout the state. The CEMAP monitoring program is a cooperative effort to assess the estuaries of the Pacific Coast through comparison of monitoring data from Washington, Oregon, and California.

In support of the DEQ mission statement of restoring and protecting Oregon's water, air and land, the WQM section is currently involved in the following activities:

1. Collecting representative, valid environmental data through physical, chemical, and biological sampling and assessment.
2. Managing environmental data to ensure availability of accurate and complete data from agency programs and the general public.
3. Analyze and interpret water quality related data to produce reports which identify water quality conditions, identify threats to water quality, evaluate trends, and model proposed actions.

Table 5. Programs within the Watershed Assessment Section of the DEQ Laboratory

	Program		
	Ambient River Monitoring	Volunteer Monitoring	Coastal Environmental Monitoring and Assessment Program (CEMAP)
Objectives of the Program	Assess water quality conditions and trends Provide data for TMDL models Provide a basis for compliance with WQ standards	Assist volunteer groups in reliably measuring water quality Develop quality assurance plans Training volunteers Verifying sampling technique Assisting with data submission	Develop monitoring designs Develop a Coastal program Integrate and synthesize existing data Coordinate with Oregon Plan for Salmon and Watersheds 305b reports 303d listings Resource management
Extent of Monitoring	151 sites Large Streams Integrator sites Most sites 6 times a year Willamette Trend Sites (6) 12 times a year SE Oregon site (6) Statewide Geographic Coverage Some sites sampled since the late 40's	Approximately 40 Watershed councils -- 11 in NCB Soil and water conservation districts Other volunteer groups (schools, community groups) Over 700 sites monitored statewide	1999- 80 total sites all estuaries excluding Columbia River 30-site intensive in Tillamook 2000- 50 sites in Lower Columbia River 2001- 32 sites all estuaries excluding Columbia Estuary
Parameters	Alkalinity, BOD, Chlorophyll a, COD, Specific Conductance, DO, Do % Sat., e. coli, Fecal Coliform, Ammonia, Nitrate & Nitrite, TKN, pH, Pheophytin a, Dissolved Ortho-Phosphate, Total Phosphate, Total Solids, Temp, TOC, Turbidity ...just to name a few	Various, but commonly temperature, bacteria, turbidity, dissolved oxygen, conductivity and more	Low dissolved oxygen, eutrophication, chemical & biological contamination, habitat modification, cumulative impacts
Data Products	303(d) list 305(b) report Oregon Water Quality Index TMDL development TMDL effectiveness DEQ/EPA Performance Partnership Agreement Progress Board Benchmark Report	Watershed assessments TMDL Development Supplement WQ database 303(d) lists Best management practice development (SB 1010) TMDL effectiveness	Determine the extent of contamination in the estuary CEMAP-EPA Reports 303(d) lists 305(b) Report TMDL development

Throughout the North Coast Subbasins area, there are 4 watershed councils that are actively engaged in longterm water quality monitoring. Another 5 councils are interested in becoming active in monitoring. All councils are currently monitoring the success of implementation projects that are expected to improve water quality within the subbasins. Data from these councils is submitted to DEQ for evaluation and is made available on the agency website.

Forestry

The Forest Practices Monitoring Program (FPMP) is an important component of the adaptive management process. The FPMP 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 (OAR 629-635-0110 (3)) and under statute with regard to stewardship plans (527.662 (d)) and sensitive resource sites (527.710 (3)).

This monitoring strategy (ODF 2002a) focuses on four types of monitoring to address forest practice program and OPSW goals and objectives. 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 recently completed an analysis of forest practice compliance on non-federal forest lands in Oregon. This study determined rates of compliance for a large suite of forest practice rules, and the occurrence of water quality violations resulting from non-compliance. This report (ODF, 2002b) is available on the ODF website at: <http://159.121.125.11/FP/fmp/default.htm>

References

ODF. 2002a. Oregon Department of Forestry, Forest Practices Monitoring Program Strategic Plan. Oregon Department of Forestry, Forest Practices Monitoring Program.

ODF. 2002b. Oregon Department of Forestry Best Management Practices Compliance Monitoring Project: Executive Summary. Oregon Department of Forestry, Forest Practices Monitoring Program Technical Report 15.

Agricultural Lands

Monitoring and reporting of both implementation and water quality with respect to agricultural lands in the basin is the responsibility of DEQ of Agriculture (ODA) under OAR 603-090-0020(4). Under the SB1010 legislation requiring the development of Agricultural Water Quality Management Area Plans, ODA is required to establish a local water quality management area advisory committee (LAC) to develop basin plans and to review them periodically, and report to the Board of Agriculture annually. ODA policy provides that plans will be "reviewed on a biennial basis and ODA in consultation with DEQ will assess whether the plan is sufficient to meet and address water quality concerns established under the 303(d) or TMDL process or other triggering mechanisms". As part of this review the LAC will:

- recommend to the board and the director modifications to the AWQMAP that may be necessary to achieve water quality goals and objectives;
- review of the progress of implementation of the water quality management area plan, including enforcement actions taken, and requests for alternate measures that have been granted and/or

denied;

- submit an annual, written report to the Board of Agriculture and the director, summarizing meetings held, advisory committee members present, actions taken, and progress and impediments toward achievement of water quality management area plan goals.

Reports may be developed based on data collected by Local Management Agencies (LMAs) working with ODA on implementation of the AWQMAPs. The LMAs are funded to develop individual farm plans for operations in the planning area. In the North Coast Basin, these LMAs are generally the Soil and Water Conservation Districts working under contract to ODA and with grants from the Natural Resources Conservation Service (NRCS) through the Environmental Quality Incentives Program (EQIP). Reports to the BOA and Director will include statistics on numbers of farm plans developed and types of management practices being employed. These reports will be available to DEQ for review in assessing implementation progress.

Water quality and landscape monitoring is also being conducted by ODA on a biennial schedule in support of the AWQMAP 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. They will also be collecting data from aerial photographs on landscape level conditions including extent and type of riparian vegetation, streambank stability, amount of shade, erosion scars (upland and riparian), indications of waste discharge, and livestock access to streams. These data will be consolidated to assess the condition of watershed in the planning area and relative levels of compliance with the AWQMAP.

Oregon Department of Transportation

ODOT's monitoring and evaluation program is tied to performing research projects that address best management practices and effectiveness of the practices and refining practices as appropriate based on results (see Appendix 3).

CHAPTER 10 – 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 North Coast Subbasin 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.

Public involvement is also enhanced through direct association and contact with existing public groups that work toward restoration and environmental protection. Watershed Councils, the Lower Columbia and Tillamook Bay Estuary Partnerships have and will continue to play an important role in development and implementation of TMDLs and Water Quality Management Plans in the North Coast Basin.

CHAPTER 11 – 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 subbasin 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 North Coast Subbasins.

<u>Program</u>	<u>Agency/Source</u>
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

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. Grant fund sources include:

Oregon Watershed Enhancement Board (OWEB) which 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.

Bonneville Power Administration funds are federal funds for fish habitat and water quality improvement projects. These have also included projects addressing road conditions, grazing management, in-stream structure, and other tools.

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

CHAPTER 12 – CITATION TO LEGAL AUTHORITIES

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 the DEQ. The 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. An 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.

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

ORS 468B.020 Prevention of pollution (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, DEQ shall take such action as is necessary for the prevention of new pollution and the abatement of existing pollution by:
- (a) 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
 - (b) 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.

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 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.

OREGON ADMINISTRATIVE RULES

The following Oregon Administrative Rules provide numeric and narrative criteria for parameters of concern in the North Coast Subbasins:

TMDL Parameter: Temperature
Applicable Rules:

- OAR 340-41-205(2)(b)(A)
- OAR 340-41-0026(3)(a)(D) OAR 340-41-006(54) and (55)

TMDL Parameter: Bacteria

Applicable Rules:

OAR 340-41-0026(3)(a)(D)

OAR 340-41-205(2)(e)(A)

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 measures 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.

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.

Oregon Department of Transportation

The Oregon Department of Transportation is a permittee under the NPDES program. The DEQ NPDES municipal permit program was established in 1994 and requires owners and operators of public stormwater systems to reduce or eliminate stormwater 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 stormwater 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 stormwater management plan.

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.

APPENDIX 1 – 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 North Coast Subbasins basin significantly exceed the WQS for temperature. The water quality impairment(s) in the North Coast Subbasins clearly do not result solely from current forestry activities. The proposed North Coast 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.

(2) The board shall consult with the Environmental Quality Commission in adoption and review of best management practices and other rules to address nonpoint source discharges of pollutants resulting from forest operations on forestlands.

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 throughout the state 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, Nonpoint 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 produce 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 distinguish 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 areas¹ 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 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

¹ The Executive Order replaced the concept of "core areas" with "priority areas". See (1)(f) of the Executive Order (p.5).

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 DEQ through a memorandum of understanding (MOU) signed in April of 1998. This MOU was designed to improve the coordination between the ODF and the DEQ 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 DEQ 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.

APPENDIX 2 – DEPARTMENT OF AGRICULTURE

**Agricultural Water Quality Management
Area Plan for
The North Coast Basin**

APPENDIX 3 – Oregon Department of Transportation

**Department of Transportation
Implementation Plan**

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 stormwater systems to reduce or eliminate stormwater 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 stormwater 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 stormwater 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 stormwater management program that reduces pollutant loads in the ODOT stormwater 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 stormwater 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 stormwater 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 Stormwater 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 management plans, and will be attached as appropriate to individual watershed plans.

