

**NON-REGULATORY EFFORTS
TO COMBAT NONPOINT SOURCE POLLUTION
IN OREGON**

by

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Internship Report

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NON-REGULATORY EFFORTS TO COMBAT NONPOINT SOURCE POLLUTION IN OREGON

INTRODUCTION

This report and accompanying program inventory have been prepared in support of the Oregon Department of Environmental Quality's statewide nonpoint source pollution control efforts and for use in the development of Oregon's new federally mandated Coastal Nonpoint Pollution Control Program (CNPCP).

When Congress reauthorized the Coastal Zone Management Act in 1990, it added significant new responsibilities for coastal states regarding water pollution from diffuse, widespread sources that in the past have not been regulated. Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) requires states to adopt enforceable programs to address nonpoint source pollution arising from agriculture, forestry, urban runoff, recreational boating and marinas, channelization, dams and eroding stream banks. "Nonpoint source pollution" in this context includes any discharge to the state's waters which is not regulated by the Clean Water Act's permit system, the National Pollutant Discharge Elimination System (NPDES).

When Congress mandated the coastal nonpoint source program, it directed that states' coastal programs and water quality agencies work together in developing and implementing the program. In Oregon, the Department of Land Conservation and Development (DLCD) and the Department of Environmental Quality (DEQ) are jointly responsible for the development of the coastal nonpoint control program. DLCD's Coastal Management Program implements provisions of the federal Coastal Zone Management Act. DEQ's Water Quality Division manages the statewide nonpoint source control program pursuant to Section 319 of the Clean Water Act (CWA).

Staff at DLCD's Coastal Management Program prepared an extensive report and analysis of Oregon's current array of enforceable programs and the extent to which those programs satisfy the federal requirements for the new coastal program. Gaps in program coverage were identified, and efforts to fill those gaps are currently in progress.

This report is a companion to the DLCD gap analysis. However, instead of focusing on enforceable programs, this report highlights nonpoint source control and watershed management programs that rely on voluntary efforts to achieve their goals.

Staff at DEQ have identified nine types of activities which, together with enforcement, make constitute an effective watershed management program. This report presents an inventory of the state and federal government efforts currently underway within the state of Oregon which contribute to the control of nonpoint source pollution but do not rely on a regulatory program to do so.

This is a time of extensive reevaluation and reordering of natural resource priorities and strategies at both the state and federal levels. The Clinton Forest Summit and the Forest Ecosystem Management Assessment Team (FEMAT) process have been examining federal forest policy from top to bottom. The two major federal land management agencies, the Forest Service and the Bureau of Land Management, began reviewing their policies and practices well before the Forest Summit, and have made significant changes as a result. At the state level, the Watershed Health Initiative directed \$10 million to two regions of the state during the 1993-95 biennium, in an unprecedented effort to restore salmon habitat and improve water quality.

The impetus for change comes from the visible results of past natural resource management practices: the collapse of many native salmon runs and the decline in many other species leading to a great expansion of activity under the federal Endangered Species Act. The federal court logging injunction to protect the Northern Spotted Owl triggered much activity at the state and local levels in an effort to avoid further listings and the potential economic dislocations associated with them.

THE PROBLEM: COASTAL WATERS AT RISK FROM ACTIVITIES ON LAND

During the first several decades of enforcement of the federal Clean Water Act, the Environmental Protection Agency and states focused on controlling the discharge of waste into public waters from what are called "point sources," i.e., pipes, channels, and other discrete sources. Through a permit system requiring industry to employ the best available pollution control technology, discharges into public waters have been considerably reduced, and are far cleaner than before.

Despite this significant progress, water pollution problems have continued. As point sources have come under control, it has become increasingly apparent that public waters are being affected by pollutants carried by runoff and snowmelt. This pollution from area-wide and diffuse sources is termed "nonpoint pollution" to contrast it from point sources. "Polluted runoff" is perhaps a more descriptive term than "nonpoint pollution," which is a term that surveys indicate people do not recognize or understand.

Nonpoint pollution typically occurs as the result of activities on land rather than direct discharges into the water. Any activity which disturbs or adds materials to the land has potential to contribute to polluted runoff. This includes many common activities, including clearing and grading land, grazing animals, cultivating crops, and applying lawn and garden fertilizers and pesticides.

The ubiquitous and cumulative nature of nonpoint pollution makes it less amenable than point sources to control through a system of permits. That fact, plus the historic emphasis on point sources, has resulted in polluted runoff receiving far less attention than point sources until very recently.

One aspect of the problem is that data regarding nonpoint pollution is difficult to come by. In Oregon, the most recent statewide compilation of data regarding nonpoint source was completed in 1988. The assessment process, coordinated by Oregon's Department of Environmental Quality (DEQ) pursuant to Section 319 of the Clean Water Act, gathered data on nonpoint source pollution through the use of a questionnaire completed by resource management professionals from a variety of state, federal, and local agencies. Data from the various sources were entered into a geographic information system database. The database contains data on 27,722 miles of streams throughout Oregon's 19 drainage basins.

State water quality standards are established for each of the state's 19 major river basins, and are designed to protect "beneficial uses" of that basin's waters. The state Water Resources Department has established the boundaries of the various river basins, and has also designated the "beneficial uses" which occur in each basin.

Oregon's coastal zone includes three entire basins (the North Coast, Mid Coast and South Coast) and portions of two more (the Umpqua and Rogue basins). Each of these basins has water quality standards designed to protect the beneficial uses of public domestic water supply; private domestic water supply; industrial water supply; irrigation; livestock watering; anadromous fish passage; salmonid fish rearing; salmonid fish spawning, resident fish and aquatic life; wildlife and hunting; fishing; boating; water contact recreation; aesthetic quality; and hydropower. "Commercial navigation and transportation" is a designated use on the Columbia River and the lower portions of the Rogue, as well as the estuaries and adjacent marine waters of all five basins.

In order to protect the designated uses, water quality standards have been established for physical and chemical parameters. Numeric standards have been established in all basins of the coastal zone for dissolved oxygen; temperature; turbidity; pH; bacteria; radioisotope concentrations; total dissolved solids; and toxic substances. Narrative standards have been established for dissolved gases; fungi or other growth; discoloration; floating garbage; and aesthetic conditions affecting sight, taste, smell, and touch.

In addition to numeric and narrative standards, Oregon's water quality standards contain an antidegradation policy designed to protect existing water quality even if it exceeds current water quality standards.

Section 303 of the Clean Water Act requires additional standards to be developed for application to "water quality limited" waterbodies, or waterbodies which fail to meet water quality standards. These standards are known as Total Maximum Daily Loads (TMDLs), and represent the capacity of the waterbody to assimilate pollutants of concern (the water's carrying capacity for pollution).

Results of the 1988 Nonpoint Source Assessment:

Each stream segment in the database was evaluated as to whether there was no impairment, moderate impairment, or severe impairment of the designated beneficial uses for the particular waterbody. Of the 27,722 miles of stream miles surveyed, 15,514 (56%) were reported to have at least one nonpoint source-caused water quality problem resulting in either moderate or severe impact on at least one beneficial use.

The 1988 Nonpoint Source Assessment included a judgment as to the probable cause or causes of nonpoint source pollution when a stream segment was identified as being moderately or severely impacted by that pollution. Probable causes were grouped into three categories: disturbances, e.g., vegetation removal, surface erosion; alterations, such as dredging or reservoir operations; and waste disposal and chemical use, including human and animal waste.

1. North Coast Basin

In the 1988 NPS Assessment, 904 of the North Coast basin's 4,000 stream miles were assessed. Of those, 485 miles (54 percent) were found to have moderate nonpoint source impacts, and 249 miles (28 percent) were severely impacted. Only 170 stream miles (18 percent) were reported to have no nonpoint source problems.

In the North Coast basin, landslides and surface erosion (both in the disturbance category) were each cited as probable causes for moderate or severe problems in nearly 50 percent of the stream miles which were assessed. More than 40 percent of assessed stream miles were disturbed by human or animal traffic. Road location and elimination of thermal cover to the stream were disturbances cited as probable causes for more than 30 percent of assessed streams. In the waste disposal category, more than 30 percent of assessed stream miles were impacted by animal waste and human waste, with almost as many stream miles affected by debris and waste dumping.

Figure 1 is a graph showing the distribution of the various causes of nonpoint source pollution identified in the North Coast basin.

2. Mid-Coast Basin

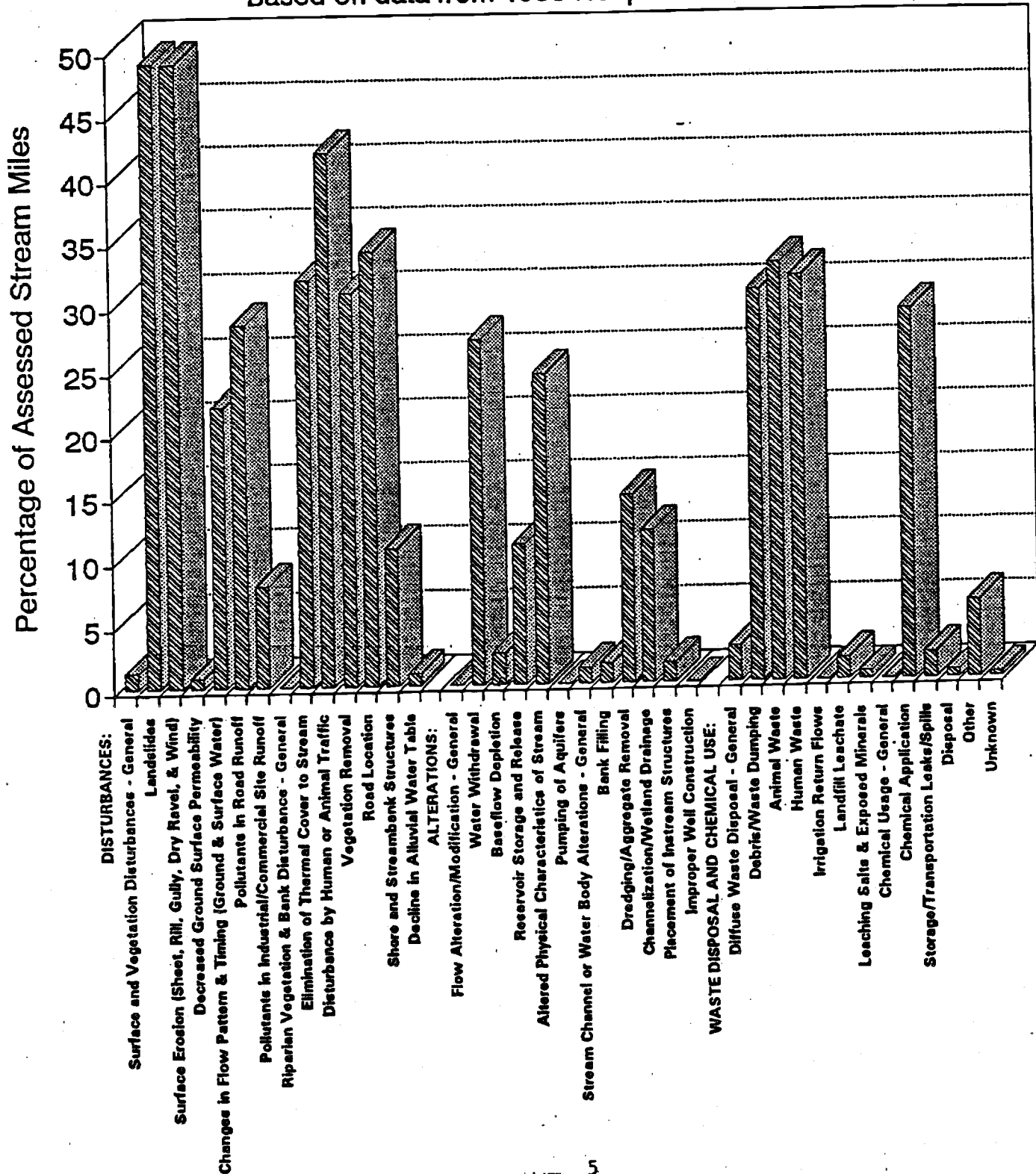
In the Mid-Coast basin, 927 stream miles out of 4500 total were assessed for the 1988 assessment. Of those 927 stream miles, severe problems were identified on 77 miles (8 percent) and moderate problems on 547 miles (59 percent). Only 33 percent of the stream miles assessed (303 miles) revealed no problems.

In the Mid-Coast basin, surface erosion caused moderate or severe problems in nearly 35 percent of the Mid-Coast basin's assessed stream miles. Elimination of thermal cover to

Figure 1

North Coast Basin

Percentage of Basin Stream Miles Affected by Various Causes
Based on data from 1988 Nonpoint Source Assessment



streams and vegetation removal adversely affected more than 25 percent of assessed stream miles. Landslides affected nearly 25 percent of assessed stream miles.

Figure 2 shows the distribution of the various causes of nonpoint source pollution cited for the 624 miles of stream on which moderate or severe problems were noted.

3. South Coast Basin

1368 of the South Coast basin's 5,000 stream miles were assessed for the 1988 report. 291 miles (21 percent) showed severe problems, and an additional 564 miles (41 percent) were reported to have moderate problems. No problems were reported on 513 of the assessed miles (37.5 percent).

In the South Coast basin, vegetation removal was the most frequent cause of nonpoint source problems, affecting more than 25 percent of assessed stream miles. Landslides, surface erosion, and elimination of thermal cover to streams were the next most common causes of moderate and severe problems.

Figure 3 displays the distribution of the various causes of nonpoint source pollution identified for the 1932 miles of the basin which were reported to have moderate or severe problems.

4. Umpqua Basin

In the Umpqua basin, 1873 of the 6400 stream miles were assessed in 1988. 622 miles (33 percent) showed severe problems, and 525 miles (28 percent) had problems assessed as moderate. 39 percent of the assessed miles reported no nonpoint source problems.

In the Umpqua basin, vegetation removal was the cause of nonpoint problems in more than a quarter of assessed stream miles. Landslides and water withdrawal were cited as the cause of nonpoint problems in about 20 percent of assessed stream miles. Road location was the cause in almost 18 percent of assessed stream miles. Figure 4 shows the distribution of the various causes reported for the 1,147 basin stream miles which were evaluated as having moderate or severe impairments.

The Coquille River has failed to meet water quality standards for dissolved oxygen, and also has problems with bacteria and temperature. It is subject to Total Maximum Daily Load (TMDL) requirements.

5. Rogue Basin

2028 of the Rogue basin's 6500 total stream miles were assessed during the 1988 Assessment. 344 miles (17 percent) had severe problems, and 555 more miles (27 percent) had problems rated as moderate. 1129 miles (56 percent of the assessed miles) did not report problems.

Figure 2

Mid Coast Basin

Percentage of Basin Stream Miles Affected by Various Causes
Based on data from 1988 Nonpoint Source Assessment

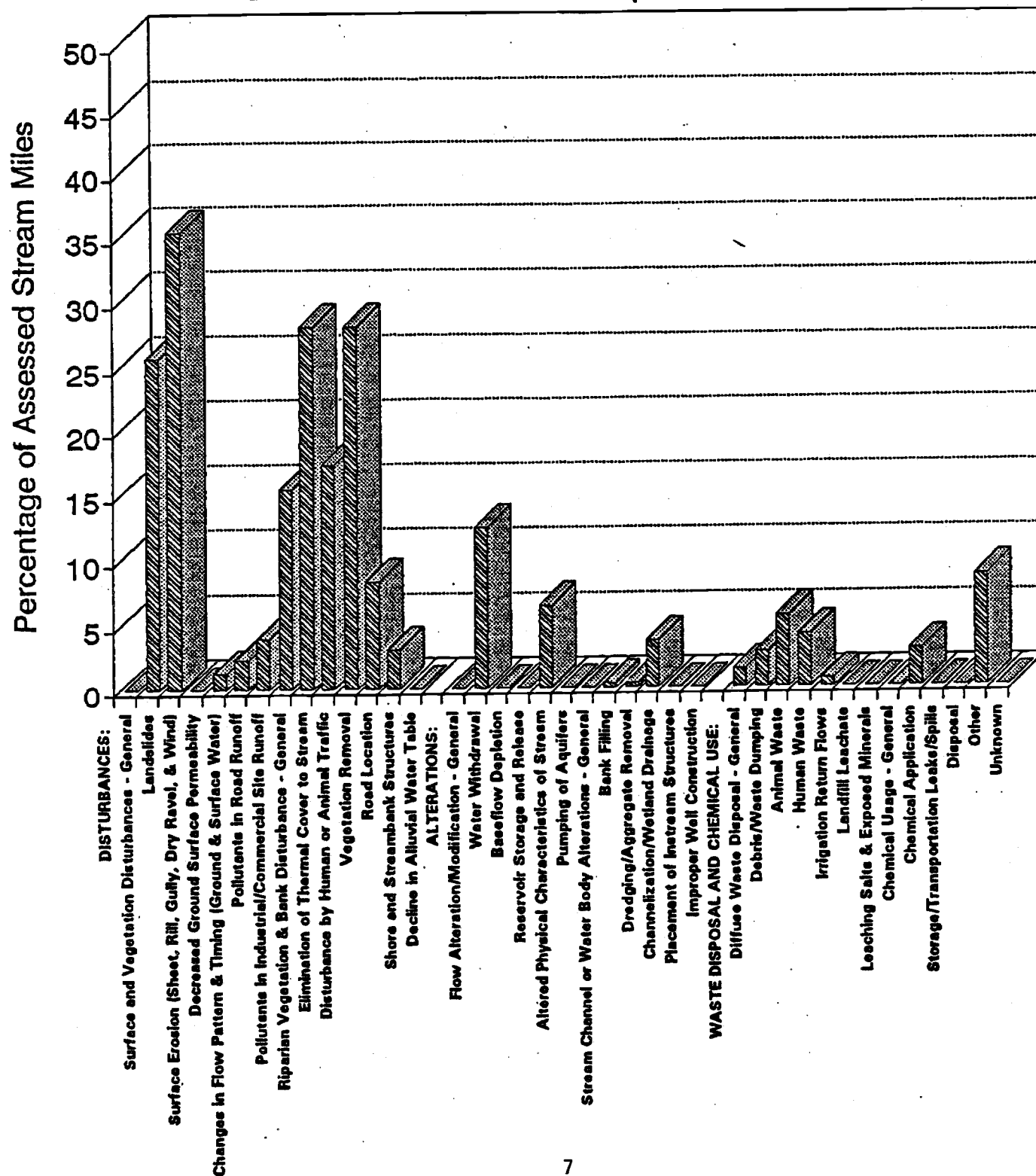


Figure 3

South Coast Basin

Percentage of Basin Stream Miles Affected by Various Causes
Based on data from 1988 Nonpoint Source Assessment

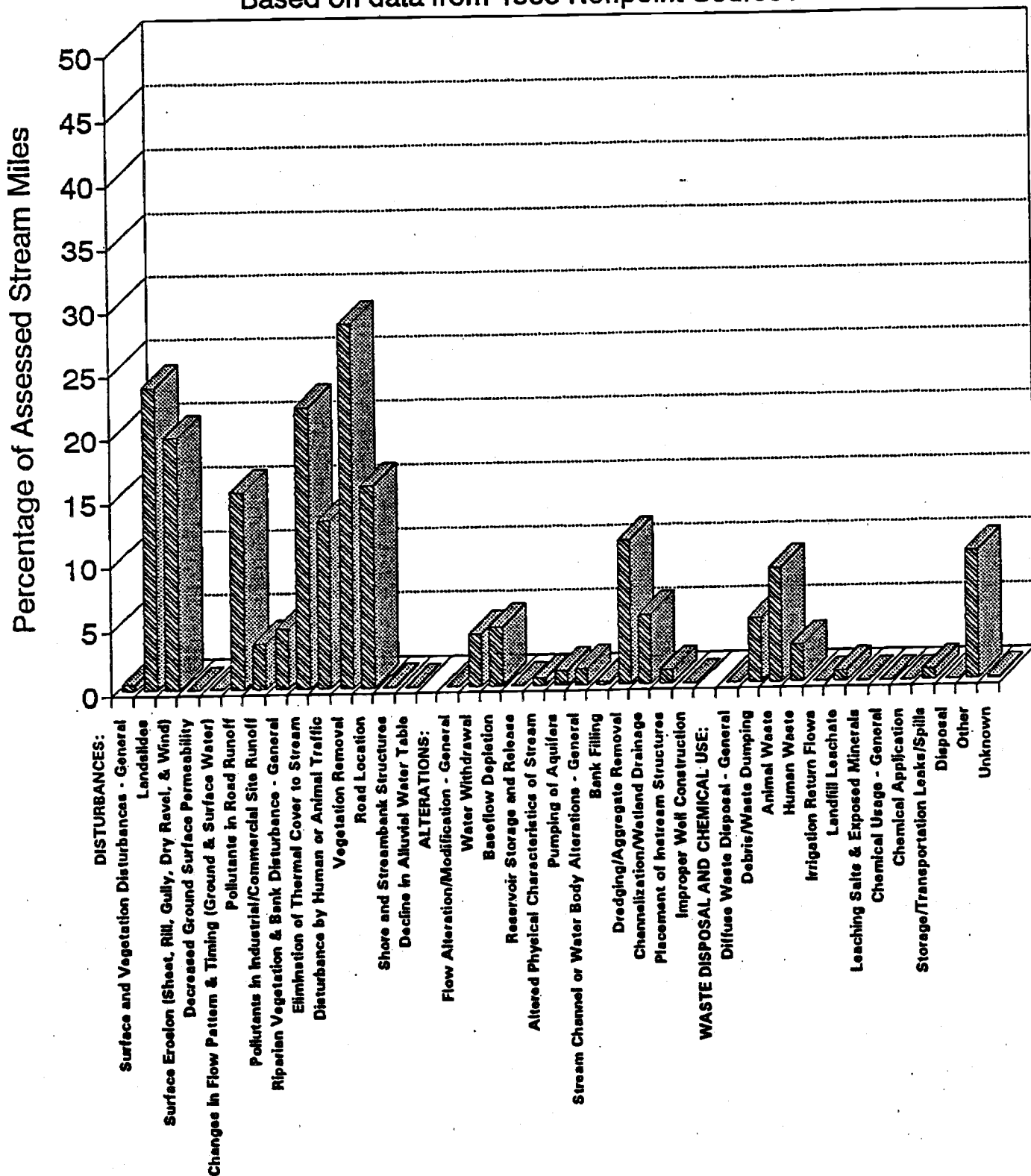
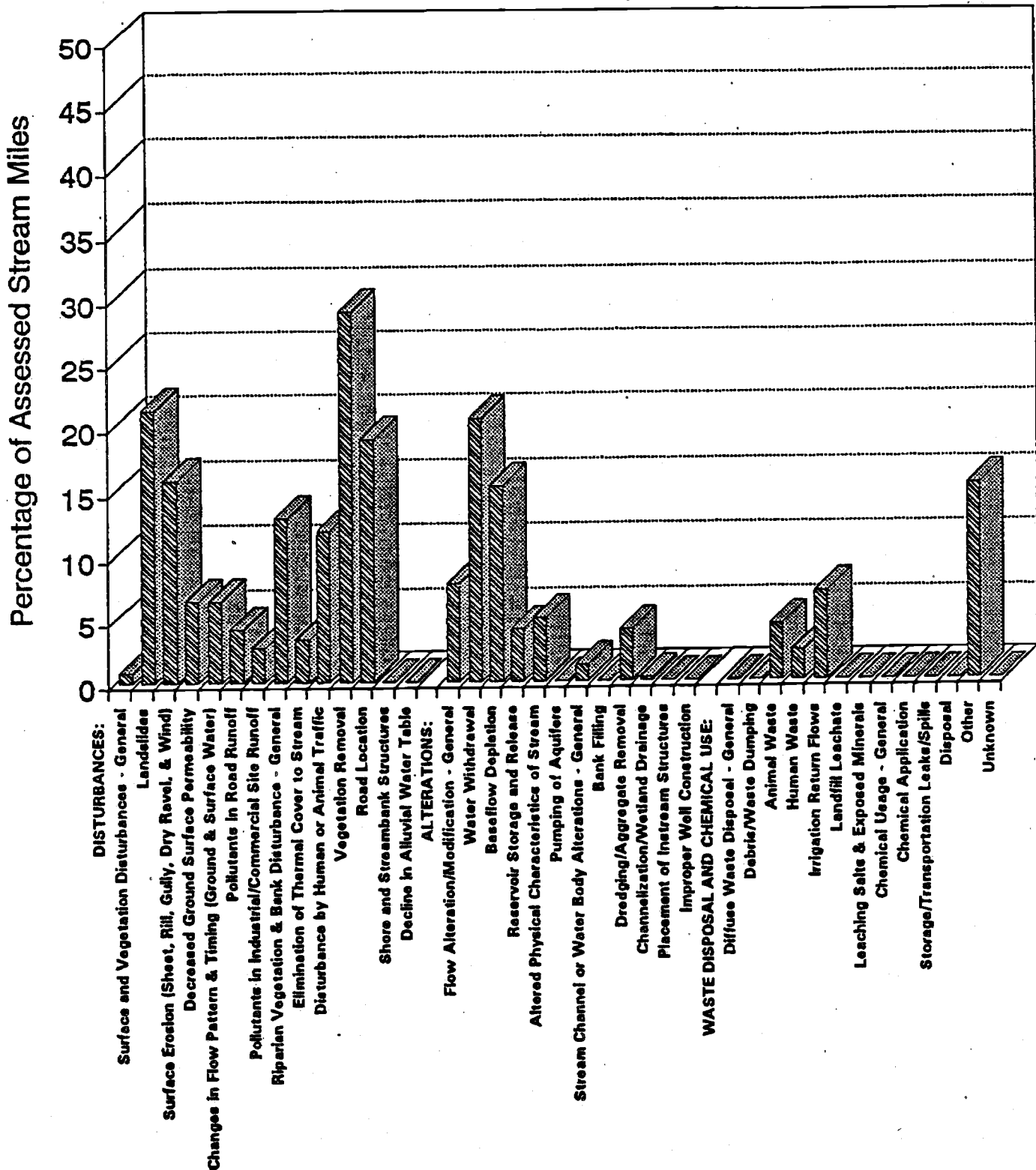


Figure 4

Umpqua Basin

Percentage of Basin Stream Miles Affected by Various Causes
Based on data from 1988 Nonpoint Source Assessment



In the Rogue basin, which includes major portions not in the coastal zone, water withdrawal was the cause of nonpoint problems in over 25 percent of assessed stream miles. Vegetation removal and surface erosion each were cited in more than 25 percent of assessed stream miles. The distribution of the various causes for the moderate and severe impairments noted on 899 stream miles in the basin is displayed in Figure 5.

OBJECTIVES

The objectives of this project included both the gathering of information and analysis of that information:

- Objective 1: To prepare an inventory of existing state and federal government nonregulatory programs which assist in control of nonpoint source pollution (polluted runoff).
- Objective 2: To analyze the extent to which existing nonregulatory programs contribute to effective control of nonpoint source pollution (polluted runoff).

INVENTORY METHODS

A checklist of desired information was developed using a sample Inventory Fact Sheet from the National Estuary Program as a starting point. Information about programs was obtained from a review of written documents and through interviews with program managers. Once all the information was gathered, the inventory form was completed and sent to program staff for their review.

In addition to basic information such as program name, agency, and contact person, the following information was collected for each program:

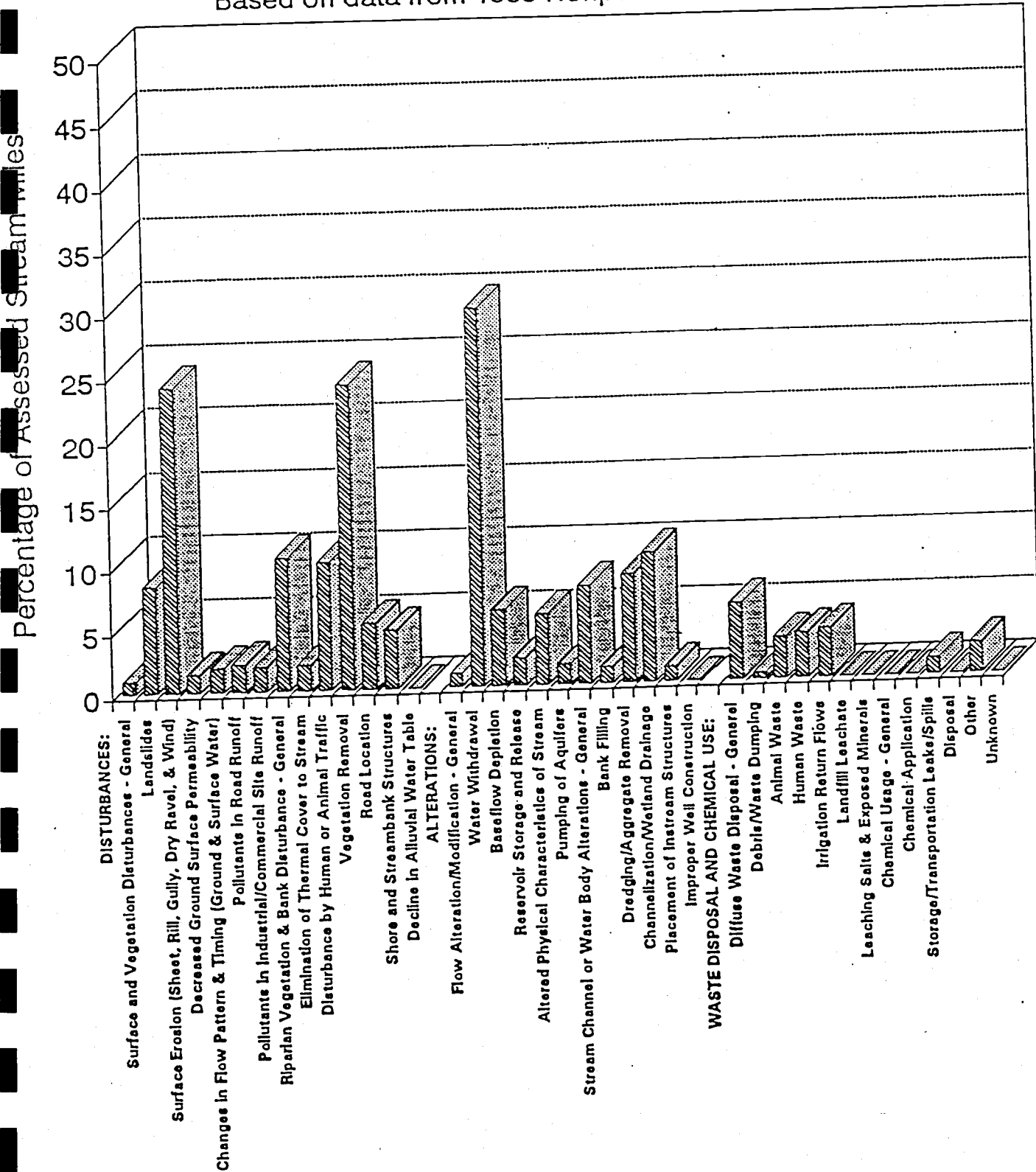
WATERSHED MANAGEMENT PROGRAM ELEMENTS: This section of the inventory identifies which of DEQ's ten watershed management program elements are supported by the program. Nonpoint source pollution can enter a stream, river, lake, or estuary from any point in the watershed, and in this respect is fundamentally different from point source discharges directly into waterbodies. Nonpoint source pollution control, therefore, must be able to address all land and water uses within a watershed to provide effective protection. Watershed management is thus in many ways synonymous with nonpoint source pollution control.

Effective watershed management must therefore encompass more than a set of prohibitions against activities generating nonpoint source pollution. Recognizing this, DEQ's nonpoint source control staff have developed a description of ten program elements which all play an important role in dealing with nonpoint source pollution and attaining the state's water quality standards.

Figure 5

Rogue Basin

Percentage of Basin Stream Miles Affected by Various Causes
Based on data from 1988 Nonpoint Source Assessment



1. STANDARDS: Definitions of the desirable and/or minimum acceptable conditions necessary to support sensitive beneficial uses (e.g., standards or benchmarks for water quality, erosion, riparian condition, upland vegetation, or other watershed condition parameters).

Standards are essential to determining whether a problem exists, what the extent of that problem is, and how to measure progress in solving the problem. Water quality standards are the most familiar standards for assessing pollution, and in many ways reflect the health of numerous watershed processes, but they are not the only way to measure nonpoint source pollution problems. The importance of riparian areas to water quality has led to the development of standards for assessing the health of these critical regions. And because soil erosion is perhaps the one process which causes the most nonpoint source pollution problems, due to the effects not only of the soil itself but the chemical constituents which adsorb to soil particles, standards for measuring soil erosion can provide an important measure with which to assess nonpoint source pollution problems.

In a less developed stage are standards relating to the health of upland regions (other than erosion status) and standards addressing the condition of larger units, including ecosystems and watersheds as a whole. The complexity of such natural systems, and their variability, make setting standards a daunting task. Efforts are underway, however, and are reflected in this inventory.

2. ASSESSMENT: Condition assessment of the water specifically and of the watershed as a whole, focusing on the standards established above.

Assessment can include actual water sampling and testing as is done in the ambient water quality monitoring program, or it can involve the exercise of professional judgment as to how well natural systems are performing their water quality-related functions. Assessment can be done on a one-time basis, or it can be done over time to analyze trends. Currently, there are efforts to assess water quality, aquatic habitat, riparian condition, upland condition, soil erosion, and watersheds as a whole. In many cases, assessment involves comparison of actual conditions to established standards; in other cases, assessment is used in the development of standards or for comparison among a number of locations.

Assessment work is a critical component of watershed management. Assessment tools are needed to identify sources of problems, the extent of problems, and progression over time. Priorities for the use of limited restoration and enhancement funds need to be based on accurate assessment of problems if the funds are to be used effectively. In addition to targeting resources, assessment is critical in documenting progress in solving problems. Watershed management is not yet (and probably never will be) an exact science; at this stage, it is important that systems be established so that regular feedback is provided to those managing the programs. Assessment and monitoring are needed to provide objective information about which techniques work and which are ineffective. An adaptive management style relies on continuing assessment data to refine tools and evaluate progress.

3. COORDINATED WATERSHED PLANNING: The joint and cooperative evaluation by all watershed stakeholders of needs, opportunities, constraints, and options for sound watershed management; the production of a practical and implementable action plan.

Because nonpoint pollution comes from so many sources, and because its control can involve economic costs, the potential for conflict is inherent in control efforts. In addition, effective control requires behavior change on the part of many individuals and businesses, far more than can be effectively controlled and monitored in a regulatory context. "Solutions" imposed from the top down can meet resistance in direct and indirect ways, including legal challenges and failure or refusal to comply. Those involved in any aspect of natural resource management have come to recognize the value of bringing all interests to the table, developing and working with a common base of information, and jointly developing and negotiating solutions to problems identified and acknowledged by all. This is neither an easy nor a speedy process, and its success depends in part on the good faith of the participants as well as the skill of those who guide the process.

Focusing on the watershed as a whole also makes sense in terms of the natural systems at work which affect nonpoint source pollution. Watersheds are hydrologically defined drainage systems, and their boundaries often bear no relationship to political boundaries. Without coordinated action, even well-intentioned actions by different jurisdictions can operate at cross-purposes. The coordinated watershed planning approach can take advantage of the synergy that arises when a consistent approach is employed over an entire watershed.

The U.S. Environmental Protection Agency has been advocating a basin-wide or watershed approach for nearly a decade. EPA's programs, and those of other federal agencies, have moved toward an integrated watershed approach. In Oregon, state agencies have also recognized the value of integrated watershed planning.

Coordinated watershed planning is also a means for addressing and incorporating goals other than those related to water quality. This integration of other goals is a critical factor in the success of the planning effort.

4. EDUCATION: The delivery of information about watershed functions, values, conditions, responses, and management techniques; offered to land managers and the general public; intended to direct attitudes, beliefs, and actions toward improved watershed management practices.

Information about the way watersheds function is critical to understanding the causes of nonpoint source pollution, and without such understanding, actual changes in behavior are unlikely to occur. There is certainly some overlap between education and technical assistance, another program element described below. For purposes of this inventory, education encompasses the more general kind of information, whereas technical assistance implies application of that knowledge to a specific situation. Included in this inventory are

programs designed for schoolchildren as well as those for adults.

5. DEMONSTRATION PROJECTS: Relatively small-scale projects designed to demonstrate the viability of sound watershed management techniques; sited widely throughout the state to promote best management practices and to help galvanize local activism.

Demonstration programs have long been a mainstay of federal- and state-assisted agricultural programs. The basic premise is that change in land management practices will be more likely to occur if there is visible evidence that a new practice works as well as the old. Ironically, many of the practices that were promoted in the past through demonstration projects, most notably the use of chemical fertilizers and pesticides, are now known to be some of the most significant contributors to nonpoint source pollution.

Today, demonstration projects can show landowners that alternatives exist, that they are feasible in Oregon right now, and that they can work to reduce the sources of nonpoint pollution.

6. TECHNICAL ASSISTANCE: Field-based experts and literature resources to help land managers select and implement best management practices suited to their ecoregion, land use, style of operation, and other management goals.

In today's information age, the problem for many land managers is not a lack of information, but too much. The growth of technological approaches, research studies, commercial information--these can present a bewildering array of options for just about any activity that generates pollution. In the face of all of this information, technical assistance can be the critical factor in adoption of practices which will reduce pollution.

7. COST-SHARE ASSISTANCE: Financial assistance and incentives for implementation of watershed enhancement practices on private lands; coupled with contractual agreements by landowners to maintain the enhancements for an extended period.

For the purposes of this inventory, this classification also includes grants to public entities (for example the Boating Facility Grants), and tax incentives.

Cost-share assistance is another element that has long been a part of federal agricultural policy. Cost-share is different from a grant in that the government pays only a portion of the costs and requires the landowner to pay the rest. This ensures that the landowner will have a stake in the success of the cost-shared practice.

8. STEWARDSHIP: The adoption by local groups of responsibility for the condition of their watershed resources; active local promotion of the concept of watershed enhancement and protection of sensitive beneficial uses.

Effective control of nonpoint source pollution cannot come solely from top-down efforts. Local individuals and groups have knowledge of local practices and influence with local officials and citizens. In the long run, these local efforts are critical to achieving water quality standards.

9. WATERSHED ENHANCEMENT PROJECTS: Coordinated enhancement and protection projects covering whole watersheds and sustained over a number of years; perhaps initiated sooner or more densely in higher priority areas but also implemented in every ecoregion and geo-political area of the state.

Ideally, these projects are developed through a coordinated watershed planning process. As with the planning process itself, enhancement can benefit immensely from the synergy arising from a variety of approaches all targeted at the same objective.

10. ENFORCEMENT: The field-based capability to investigate and remedy the violation of applicable standards or regulations.

In an ideal world, enforcement would not be necessary because effective programs to implement the nine other watershed management program elements would result in attainment of water quality standards. In the real world, however, enforcement is a necessary component of an effective program. Sometimes just the existence of enforcement capability is enough to spur adoption of practices that aid in nonpoint source control; in other instances, actual enforcement efforts are necessary.

Although this inventory does not include enforcement programs, these programs must be considered in any examination of watershed management capabilities.

For each program falling into one of the first nine categories, the following additional information was gathered:

EPA MANAGEMENT MEASURES: As required by the Coastal Zone Act Reauthorization Amendments of 1990, the Environmental Protection Agency (EPA) published management measures which coastal states must implement in their coastal zones through enforceable state programs. There are 56 management measures in six categories: agriculture, forestry, urban runoff, marinas and recreational boating, hydromodification, and wetlands and riparian areas. These management measures are not the same as management practices, but are more analogous to the results expected from management practices. The statute defines "management measures" as "economically achievable measures to control the addition of pollutants to our coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives."

The programs described in this inventory are for the most part not considered enforceable, and thus would not be considered by NOAA/EPA to implement the management measures.

Yet the programs do provide support for the achievement of the management measure's objectives. For that reason, the management measures which are supported by each program are included in the program inventory.

A list of the management measures, with a summary of their requirements, is included in Appendix A. They are in the same order as they appear in the federal guidance document, although a slightly different numbering system is used.

PROGRAM AUTHORITIES: Many of the programs in the inventory are explicitly mandated by state or federal law; others are specifically authorized but not mandated; still others are not mentioned in authorizing legislation but fall within an agency's general responsibilities. For each program, the inventory includes the federal or state statutes or regulations, if they exist, which authorize that program.

PROGRAM DESCRIPTION/OBJECTIVES: This section of the inventory includes a brief description of the program and its primary goals and objectives, particularly as they relate to nonpoint source pollution control in Oregon. Information was derived from program documents and interviews with program personnel.

GEOGRAPHIC SCOPE: In addition to a narrative description of the geographic scope of each program, this section of the inventory contains references to the state-designated river basins where the program operates, if it is not a statewide program. The Oregon Water Resources Department has designated the 19 river basins and their boundaries. The numbering system used is that employed in EPA's STORET system.

FUNDING: Most of the inventories contain information about the amount, source, and timing of a program's funding. This information is approximate, and was included to convey an idea of the scope of the program.

COORDINATION WITH OTHER PROGRAMS: Where specific links exist, this information was included.

PROGRAM EFFECTIVENESS INFORMATION: The National Estuary Program guidance contains a detailed description of a program analysis process that was used as the starting point for designing the survey instrument used in this inventory. That process contemplates a very thorough institutional analysis that examines a program's structure, its statutory mandate, support from the public, and a variety of other factors.

Such a detailed analysis of the effectiveness of the many programs in this inventory is far beyond the scope of this project. Nevertheless, the decision was made to ask program personnel limited questions about the effectiveness of their programs. The accuracy of the effectiveness information therefore depends strongly on the perspective, knowledge, and forthrightness of those individuals providing information for the inventory. In fact, in most cases people were quite willing to share their perceptions of program inadequacies as well as

program successes. Although no effort was made to investigate effectiveness beyond asking the questions on the inventory form, the information that was provided does shed light on the typical barriers to effectiveness of the various kinds of programs.

What this inventory does NOT include:

The scope of this project is limited by time and resources. Research projects are not covered by this inventory, but are obviously of great importance in developing new solutions to nonpoint source pollution control. The efforts of private groups are not represented, although they are significant. Programs which designate certain areas for protected legal status are not included in this report, although they serve an important stewardship function.

**SUMMARY REPORT:
NON-REGULATORY EFFORTS
TO COMBAT NONPOINT SOURCE POLLUTION
IN OREGON**

STANDARDS

WATER QUALITY STANDARDS:

Water Quality Standards (DEQ)
Biological Water Quality Standards (DEQ)

RIPARIAN STANDARDS:

Desired Future Conditions (USFS)
Properly Functioning Conditions (BLM)

WETLANDS STANDARDS:

Wetland Water Quality Standards (DEQ)
Oregon Freshwater Wetlands Assessment Methodology (DSL)

EROSION STANDARDS:

Soil Loss Equation (NRSC)
Highly Erodible Lands (NRSC)

UPLAND AND WATERSHED HEALTH STANDARDS:

Oregon Stage 1 Watershed Assessment (DSL)
Properly Functioning Conditions (BLM)

DESCRIPTION

WATER QUALITY STANDARDS:

The Oregon Department of Environmental Quality has the statutory authority and responsibility to establish water quality standards for the state. These standards encompass pollutants from all sources, point and nonpoint.

DEQ has established water quality standards for each of the state's 19 basins. The standards are designed to protect the beneficial uses of water designated for each basin by the state Water Resources Department. Numeric standards define the minimum and/or maximum acceptable values for a standard list of physical and chemical parameters which impact the designated beneficial uses. In addition, the standards for each basin require the highest and best practicable treatment and/or control of wastes, activities, and flows to maintain the values for those same parameters at their most desirable levels.

Water quality standards are reviewed every three years to reflect the results of new research, newly developed substances, and advances in technology. The latest triennial review process has identified temperature, bacteria, pH, dissolved oxygen and groundwater parameters as possibly requiring changes in standards; amendments will be presented to the Environmental Quality Commission for approval during 1994.

DEQ has also recognized that standards for physical and chemical parameters alone may be inadequate to protect all the beneficial uses of the state's waters. Consequently the state has begun to develop standards to measure the status of the aquatic biological community. Biocriteria are currently in narrative form, and work is progressing on the research and monitoring necessary to eventually define numeric standards.

RIPARIAN STANDARDS:

The recent development of standards for riparian health reflects the growing understanding of the importance of riparian areas in protecting water quality, in providing habitat for various species, and in maintaining the health of aquatic ecosystems.

The Bureau of Land Management's riparian standards relate primarily to rangelands and focus on the physical functioning of the drainage system. These narrative standards are in the form of a checklist. Based on the standards in the checklist, each stream reach will be designated as functioning properly, functional but at risk, or nonfunctional.

The U.S. Forest Service is also developing standards for healthy riparian areas. These Desired Future Conditions apply to forested regions, and are focused on those factors important to aquatic habitat. These standards are currently in draft form.

At the state level, the Oregon Department of Fish and Wildlife has done extensive work collecting data on riparian conditions as part of its Aquatic Inventory Project (see Assessment section for more detail), and has considered developing numeric standards for healthy riparian areas. A major barrier has been the fact that different standards are needed for different types of ecosystems, since the conditions reflecting health in the headwaters of a forested stream, for example, differ significantly from healthy conditions in an estuary or floodplain. Ecosystem-specific riparian standards do not presently exist at the state level.

Riparian areas which are wetlands are also covered by the wetlands standards discussed next.

WETLANDS STANDARDS:

Also under development during DEQ's triennial review process were narrative standards for water quality in wetlands. These standards are needed due to the unique character of wetlands and the inability of the general water quality standards to adequately protect the diverse functions of wetlands. Narrative standards will eventually be replaced with numeric standards.

The Division of State Lands has developed the Oregon Freshwater Wetlands Assessment Methodology, which is used to assess whether a wetland 1) provides, 2) has the potential to provide, or 3) does not provide each of nine ecological functions and conditions. The assessment methodology contains evaluation criteria that constitute standards for each of the nine functions and conditions.

EROSION STANDARDS:

The U.S. Natural Resources Conservation Service recently began using a new method of estimating soil loss on agricultural lands. The Revised Universal Soil Loss Equation went into effect for most purposes in October, 1993, although it is being phased in slowly for existing conservation plans. The RUSLE assesses the same factors as the earlier version of the equation, including soil type, climatic differences and crop cover. The method estimates soil loss per acre per year, which is then used in the development of farm conservation compliance plans required for Highly Erodible Lands (HEL).

NRSC uses erosion standards to determine whether cropland is an HEL. Approximately one-third of all cropland in the nation is considered highly erodible according to the NRSC standard.

UPLAND AND WATERSHED HEALTH STANDARDS:

BLM's Properly Functioning Conditions standards include an upland component. Like the riparian standards, the upland component consists of a checklist of factors which affect or reflect the system's hydrologic functioning. The standards for uplands are still in draft form, and work continues on refining them.

The Oregon Stage 1 Watershed Assessment, which is now in its start-up phase, is expected to develop a methodology to assess watershed health. Whether this effort will produce explicit standards for healthy watersheds is not known. At present, Oregon does not have any formal standards for watershed health.

ANALYSIS

Development of standards, whether for water quality, riparian habitat, or watershed health, is a complex process that is both time-consuming and expensive. Standards must not only be based on scientific research, but require development with participation of users, those who would be affected, and the public. In addition, after development, standards need a period of testing so they can be refined.

The physical and chemical water quality standards are in the most advanced stage of development, and, given their long history and institutional status, are likely to continue to be allocated the resources necessary for continued refinement and development.

Biocriteria are in an early stage of development, but Oregon is ahead of most states. Biocriteria are the only standards in place that are explicitly designed to reveal nonpoint source pollution problems.

DEQ does not have statewide standards for the nutrient forms of nitrogen and phosphorus, other than a nitrate standard based on drinking water requirements. These standards do not address eutrophication. DEQ does have criteria for chlorophyll a values that indicate the potential for nuisance phytoplankton growth. Values exceeding the criteria trigger a process of further study of sources and impacts and development of a control strategy "where technically and economically practicable." (OAR 340-41-150). Oregon also has a standard for pH, which, like chlorophyll a, can be used as an indicator of eutrophication.

When water quality data document that a waterbody is "water quality limited" under the Clean Water Act, a process is triggered to develop total maximum daily loads (TMDLs) of problem pollutants. The process requires intensive study to estimate loads for pollutants of concern and the waterbody's assimilative capacity for those pollutants. Maximum pollutant loads are then allocated among all the known sources of the pollutant, including nonpoint sources. Nutrient standards have been formulated for loading allocations in several TMDL waterbodies in Oregon.

Continued effort is essential to development of standards for riparian areas. Adequate protection of these areas will depend in part on an ability to assess their functioning, and appropriate standards are essential to such assessment. Present standards are mostly still in draft form.

DSL's freshwater wetlands standards represent a major step forward in the effort to protect the state's wetlands. There is a need for development of a parallel process for marine-influenced wetlands.

Standards for upland areas and for watershed health are in the least advanced stage of development. Soil erosion standards have progressed the furthest. It is likely that the most important use of standards for watershed health will be to guide future funding decisions for protection and restoration of watersheds. For these purposes, standards need not be of the same nature as standards for water quality or even for riparian areas. A more general measure of watershed health will probably be adequate for purposes of comparison between basins.

The level of certain pollutants in sediments can also be used as a measure of nonpoint source pollution. DEQ has not adopted sediment quality criteria data, although it has developed an Interim Sediment Quality Guidance which is used primarily for evaluating the suitability of dredged sediments for in-water disposal. Oregon does not now have any plans to develop sediment criteria, in part because of lack of resources. The U.S. Environmental Protection Agency is continuing its research on such standards, with the objective of providing guidance to states in the form of criteria, as it does with other water quality criteria. Several other

states are, however, developing such standards, and staff at DEQ are following the progress of those other states.

RECOMMENDATIONS

1. DEQ should consider the adoption of nutrient water quality criteria to address human-induced eutrophication. In DEQ's 1988 Nonpoint Source Assessment, nutrients were one of the most common pollutant types identified in most basins. Nutrients are a common constituent of runoff from agricultural sources including animal waste and commercial fertilizers, and also reach the state's waters from failing septic systems. A nutrient standard could enhance DEQ's ability to identify certain nonpoint source problems before significant nuisance phytoplankton growth occurred. In addition, excess nutrients may be a factor in the toxic marine phytoplankton blooms that cause paralytic shellfish poisoning and domoic acid shellfish poisoning. A nutrient standard could help to reduce land-based nutrient inputs to the nearshore marine environment.

2. DEQ should follow the progress of EPA and other states in gathering the background information needed to develop sediment contamination standards. This recommendation is based on the assumption that background information regarding contaminated sediments is already being gathered by EPA and other states, and that the State of Oregon lacks the financial resources needed to independently develop its own standards. The state should, however, closely follow the progress of EPA and other states.

ASSESSMENT

GENERAL WATER QUALITY ASSESSMENT:

- Ambient Water Quality Monitoring Network (DEQ)
- Citizen Lake Watch Program (DEQ)
- Lower Columbia Bi-State Water Quality Study (DEQ)
- Willamette River Water Quality Study
- National Water Quality Assessment Program (USGS)
- National Resources Inventory (NRSC)
- Shellfish Sanitation Program (ODA)

NONPOINT SOURCE ASSESSMENT:

- 1988 Oregon State Assessment of Nonpoint Sources of Water Pollution (DEQ)
- Water Quality Assessment Database (DEQ)
- Nonpoint Source Biomonitoring Program (DEQ)

CHANNEL AND RIPARIAN ASSESSMENT:

- Stream Inventory Program (USFS)
- Water Quality Database (USFS)
- Aquatic Inventory Project (ODFW)
- Salmon Trout Enhancement Program (ODFW)
- Riparian Survey (BLM)

WETLANDS ASSESSMENT:

- Wetlands Inventory (USFWS)
- State Wetlands Inventory (DSL)
- Oregon Freshwater Wetland Assessment Methodology (DSL)
- Wetlands Inventory (NRSC)

WATERSHED ASSESSMENT:

- Northwest Economic Adjustment Initiative (USFS; BLM; EPA)
- River Basin Studies Program (NRSC)
- Watershed Health Initiative (WRD)
- Oregon Stage 1 Watershed Assessment (DSL)

DESCRIPTION

Assessment of water quality, riparian and wetland condition, and watershed health has

burgeoned in Oregon in the past decade. There are several major reasons underlying this growth in assessment efforts. The collapse of many natural salmon stocks and the recognition that habitat degradation has played a major role in that collapse is perhaps the most important reason. Another important factor is the public acknowledgment at all levels of government that nonpoint source pollution is a major barrier to the achievement of water quality goals, and that nonpoint control efforts need to be expanded and strengthened. Technological advances in toxics sampling, increased understanding of the functions of wetlands and riparian areas, and a growing public concern for the environment have also contributed to the desire for accurate and timely information about the status of our water resources.

GENERAL WATER QUALITY ASSESSMENT:

The most common activity in assessment programs is the sampling and testing of water for the physical and chemical parameters for which standards exist. DEQ's ambient water quality monitoring program is required by the federal Clean Water Act, and regularly samples more than 118 sites for 56 physical and chemical parameters. (County health departments, the Oregon Health Division and Water Resources Department, and the U.S. Bureau of Reclamation participate in the ambient monitoring program.) Data are maintained in the Environmental Protection Agency's STORET computer system.

DEQ also conducts intensive investigations in regions where water quality problems have resulted in requirements for the setting of total maximum daily loads (TMDLs). These water quality limited areas, as they are known in federal pollution control parlance, must be studied intensively so that pollutant loads can be calculated and allocated among the various sources, including nonpoint sources. Water quality problems have led to the adoption of TMDLs and nonpoint source management plans in the Tualatin watershed and the Bear Creek watershed of the Rogue.

DEQ works with Portland State University in coordinating the Citizen Lake Watch Program, a volunteer effort that monitors water quality at about 25 lakes throughout the state. This program is discussed more fully in the section on Stewardship programs.

DEQ is also involved in major study efforts focusing on the Lower Columbia and Willamette Rivers. The Lower Columbia Bi-State Water Quality Study is a five year program sponsored jointly with the State of Washington and pulp and paper companies which are permitted to discharge into the river. The Willamette River Water Quality Study is a four year joint effort with the U.S. Geological Survey, the Association of Clean Water Agencies, Associated Oregon Industries, and pulp and paper companies in the Willamette basin. The Willamette study will sample one of the river's subbasins for an intensive look at nonpoint source pollution from agricultural lands. Both these studies are scheduled to be completed during 1995, although efforts are underway to garner resources to finance a continuing effort, at least on the Columbia.

The U.S. Geological Survey's work on the Willamette is a part of the National Water Quality Assessment Program (NAWQA), a major federal effort with long term goals of describing the status and trends of a large, representative part of the nation's surface and groundwater resources and providing an understanding of the primary natural and human factors affecting water quality. The study unit in Oregon encompasses the Willamette and the Sandy basins. The nonpoint source assessment of a Willamette agricultural subbasins is part NAWQA's focus on nonpoint sources of pollution.

The Natural Resources Conservation Service's National Resources Inventory is also part of a national effort. The NRI is a multi-resource inventory encompassing soil, water, and related natural resources on non-federal lands. Three sample points are studied within each Primary Sample Unit, which is generally 160 acres. There are 5911 sample units in Oregon, but only 4,000 on non-federal lands. Data are collected for the inventory every five years, with 1992 being the most recent study. Results will be available for Oregon in the late spring of 1994. The data management system is being upgraded to add GIS capability, and digitizing of sample points is nearly complete. Software will be added later in 1994 to make the GIS fully operational.

The state Department of Agriculture's Shellfish Sanitation Program monitors water quality (primarily for fecal coliform) in the seven estuaries approved by the Food and Drug Administration for commercial shellfish harvesting. The program also analyzes shellfish samples (for paralytic shellfish poisoning and domoic acid), performs lot testing of commercial shellfish, and conducts inspections of septic systems and other nonpoint pollution sources on the shorelines of those same estuaries.

NONPOINT SOURCE ASSESSMENT:

Oregon's last statewide nonpoint source pollution assessment took place in 1987-88, in compliance with Section 319 of the Clean Water Act. Results were published by DEQ in the 1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution. Assessment data were compiled in ArcInfo, a computerized geographic information system that enabled the production of maps showing some of the assessment results for each of the state's 19 river basins.

Approximately 25% of Oregon's stream miles were assessed in the 1988 effort. About 25% of the assessed miles showed severe nonpoint source problems, and another 30% showed moderate impairment.

Oregon has begun a staged update of the 1988 assessment. The Water Quality Assessment Database is currently analyzing data for the North Coast basin in a pilot effort. Three to four basins will be assessed each year, resulting in a loose-leaf binder of information for each basin. Data will also be available on disk. Each basin in the state will be assessed once every five years. The database relies heavily on the professional judgment of resource managers with a number of state and federal agencies. These individuals will complete the

surveys which are the primary source of data for the database.

DEQ also operates the Nonpoint Source Biomonitoring Program, which assesses streams based not only on physical and chemical water parameters, but also on physical habitat and on the health and community status of the resident biological community. At present, the program is quite small, analyzing approximately 100 samples per year from about 60 sites. Although the results of the physical and chemical analyses are entered into STORET with ambient data, there is no real connection between the ambient network and the bioassessment studies.

CHANNEL AND RIPARIAN ASSESSMENT:

Assessment of stream channel and riparian condition is a major focus of activity in Oregon at the present time. The Oregon Department of Fish and Wildlife's Aquatic Inventory Project assesses aquatic habitat and riparian condition. So far the project has assessed close to ten percent of the state's stream miles. Assessments by volunteers in ODFW's Salmon Trout Enhancement Program (STEP) complement the work done by agency biologists and are incorporated into the project's database.

The U.S. Forest Service is embarked on an assessment of riparian areas on national forest land, with the main emphasis on fish-bearing streams. Its Stream Survey Program assesses 2-3,000 stream miles per year, and has completed about 12,000 miles of surveys since the program began in 1990. Data are maintained in a corporate database developed for inventory data and called the Water Quality Database. The Forest Service also conducts project monitoring to assess the effectiveness of best management practices.

In eastern Oregon, the Bureau of Land Management has set an ambitious schedule to assess all rangeland riparian areas (12,000 - 14,000 stream miles) during this fiscal year. The assessment will result in a designation of each stream reach as 1) functioning properly, 2) at risk but functioning, or 3) not functioning. The assessment will focus on the stream channel and a riparian area of about 40 feet on each side.

WETLANDS ASSESSMENT:

Two programs play a major role in wetlands assessment in Oregon. The major focus at present is on identification of wetlands and delineation of their boundaries, although a protocol for assessing the functions and conditions of wetlands has been developed by the Oregon Division of State Lands. Initially, the protocol will be used primarily in the local wetlands planning process.

The U.S. Fish and Wildlife Service is responsible for the production of National Wetlands Inventory (NWI) maps, which overlay wetlands information on 7.5 minute (1:24,000) U.S. Geological Survey quadrangle maps. 1,869 NWI quad maps have been produced covering the entire state of Oregon, although some of the maps remain in draft form. The Fish and

Wildlife Service has produced the maps from aerial photographs. The NWI maps contain information on location of wetlands and their classification according to the Cowardin et al. 1979 system.

The NWI maps are maintained and distributed by the State Distribution Center managed by the Division of State Lands. DSL maintains the Statewide Wetlands Inventory, which contains, in addition to the NWI maps, larger-scale Local Wetlands Inventories (LWIs) and Wetland Conservation Plan Inventories (WCPIs) developed by local agencies. DSL maintains a database, called MAPTRACK, which stores information about each of the quad maps, whether it is in draft or final form, whether it has been digitized, and whether local inventories exist.

Local inventory efforts are important in identifying and mapping many smaller wetlands, since the NWI picks up only those at least two acres in size. DSL has established guidelines and rules for the LWIs, which must map all wetlands at least .5 acres in size, and the WCPIs, which must map all wetlands at least .01 acres in size. These larger-scale inventories include location, size and classification of each wetland as well as precise property boundaries. DSL-approved local inventories are then incorporated into the Statewide Wetlands Inventory.

The Oregon Freshwater Wetland Assessment Methodology was developed by DSL and released in January, 1994. The Oregon Method, as it is known, is probably the most advanced system yet developed for assessing wetland status in terms of ecological function. The Oregon Method assesses nine functions and conditions: wildlife habitat, fish habitat, water quality, hydrologic control, sensitivity to impact, enhancement potential, education, recreation, and aesthetic quality. Assessing a wetland using the Oregon Method requires the compilation of many kinds of data regarding the wetland, answering assessment questions regarding each of the values and conditions, and then, for each value and condition, determining whether the wetland 1) provides, 2) has the potential to provide, or 3) does not provide the function being assessed.

The Oregon Method is starting to be used in local land use planning and decision-making. The system can also be applied to larger areas such as watersheds and river basins, but to do so would require a very significant amount of funds.

Cultivated and cropped wetlands are not included on NWI maps. However, the U.S. Natural Resources Conservation Service maintains an inventory of such agricultural wetlands. The primary purpose of the NRSC effort is to identify wetlands for purposes of the 1985 Food Security Act's swampbuster provisions, which discourage the conversion of natural wetlands to cropland use. Producers who convert such wetlands lose eligibility for a number of federal farm subsidies, loans, crop insurance, and other commodity-related payments from the U.S. Department of Agriculture.

WATERSHED ASSESSMENT:

The term "watershed" can apply to natural drainage systems on a variety of scales, from the drainage associated with a small stream to the basin of a large river. Oregon's Watershed Health Initiative is focusing its efforts on three of the state's 18 major river basins, each of which represents a fairly large geographic area. Other programs, such as the Natural Resources Conservation Service's Small Watershed Program, work with watersheds in the range of 250,000 acres or about 200 square miles.

The Northwest Economic Adjustment Initiative, also referred to as Jobs in the Woods, will allocate significant amounts of federal funding to watershed assessment work on national forest land in Oregon, Washington, and northern California. Details are still subject to revision, but about \$36 million will be allocated to watershed work in the three states, with approximately \$20.8 million designated for watershed assessment. Within Oregon, each national forest has been allocated \$900,000 for assessment activities this fiscal year. A federal interagency working group has developed a Federal Agency Guide for Pilot Watershed Analysis which establishes a standardized protocol for the assessment effort. The guide is for the evaluation of watersheds ranging from 20 to 200 square miles. The assessment is intended to identify key processes and areas within a watershed needing treatment and to develop relative priorities for restoration. The balance of the \$36 million will be used for actual restoration work.

The Natural Resources Conservation Service's River Basin Studies program represents another approach to watershed assessment. NRSC personnel work with the U.S. Forest Service and other agencies to conduct an intensive analysis of a relatively large watershed complex. Each study takes approximately two years to complete and draws upon information from a large number and variety of sources. In Oregon, only one study is undertaken at a time. Currently the study process is underway in the Grande Ronde basin. The program's approach incorporates elements of coordinated watershed planning, involving local interests and providing education about the watershed under study.

At the state level, it appears likely that the Watershed Health Initiative will include an assessment component, in addition to project monitoring. An assessment and monitoring plan is being developed, but details are not final.

The Division of State Lands has received a grant from EPA for an Oregon Stage 1 Watershed Assessment project. The hiring process for the project leader is presently underway. The project's primary goals are to develop a broadly applicable watershed assessment protocol and to use that protocol to conduct an assessment of all watersheds in the state. One of the initial tasks will be to determine the size of the watershed study unit. The results of the assessment will enable the prioritization of watersheds for future restoration activities.

ANALYSIS

An Intergovernmental Task Force on Monitoring Water Quality noted in a December, 1992,

recommendation to the Office of Management and Budget these three particular problems with water quality monitoring in the U.S.:

Many agencies spend billions annually monitoring water quality for a variety of purposes. Roles, objectives, and responsibilities are not always clearly defined, and no clear leadership or intergovernmental strategy links these efforts.

Different agencies use different methods to measure the same parameter, often do not store information about the data that would enable others to use it with confidence, and keep the data in systems that others find hard to access.

The resulting data are often not comparable and fall short of supporting management of water resources on a nationwide basis.

These are significant problems within Oregon, as well as the nation. An impressive array of agencies is involved in assessing and monitoring water quality, yet no overall strategy links these efforts, and no one agency provides leadership, although there are efforts to coordinate activities at both the federal and state levels.

At the federal, a regional task force convened to coordinate watershed assessment activities and data systems has developed a Federal Agency Guide for Pilot Watershed Analysis, and is gathering data on existing databases and assessment activities. The Forest Service, BLM, and EPA were all involved in the preparation of the Guide, which describes methods for designing and conducting assessments of watersheds or watershed complexes from 20 to 200 square miles. If the Guide is used as intended, it will be a powerful tool for designing and coordinating watershed assessments throughout the state and the entire northwest region.

From the perspective of nonpoint source pollution control, assessment is the program element which has the most significant gaps. Currently, the best information available on nonpoint source problems in most regions of the state is the 1988 Nonpoint Source Assessment. In addition to age, the data are subject to a number of limitations.

The Water Quality Assessment Database is an effort to update and improve the 1988 assessment. Results from the pilot study indicate that one of the thornier problems may be in prompting the resource professionals from other agencies to find adequate time to complete the surveys which are the source of the data. Despite the participation of these other agencies in the planning process, actually getting the surveys completed and returned to DEQ has not always occurred in a timely manner.

The Biomonitoring Program is a pioneering effort to develop assessment tools sensitive to the ecological impacts of nonpoint source pollution. This is another activity in which Oregon is one of the leaders nationally. The biomonitoring protocols developed thus far are restricted to those in rangeland ecosystems. To be a truly effective statewide assessment and

monitoring tool, however, techniques must be tested and refined for urban areas, agricultural regions other than rangeland, and irrigated agricultural regions.

Thus, despite the work in progress, Oregon does not yet have any statewide program to assess nonpoint source pollution on a regular and continuing basis.

Even taking into consideration the assessment activities which are now underway, there are significant gaps in data coverage. Part of the reason for this is the complex nature of nonpoint source pollution and the variety of pollutant sources and types which are involved. Another factor is the expense of laboratory analysis. Yet another reason is that funding for nonpoint source pollution control is so far below the need that there is sometimes a reluctance to carve out of limited restoration funds the amounts necessary for an adequate monitoring effort.

In discussing data needs for a nonpoint source monitoring program, EPA/NOAA has identified chemical, physical, and biological water quality data; precipitation data; topographic and morphologic data; soils data; land use data; and land treatment data.

Wetlands:

The identification and classification of wetlands is the first step to assessing the current status of wetlands in the state and protecting their natural functions. Much progress has been made in the inventory process, but much remains to be done. Local inventories have been completed for only a small portion of cities and counties. Digitizing of the inventories currently lags far behind mapping. The maps are most useful when they have been digitized since they can then be used in geographic information systems. Without a digital database, it is not possible to answer questions about wetlands on a regional or watershed basis. The NWI has established standards for digitizing, and some of the maps have been digitized, but many are not. In particular, NWI maps which are still in draft form must be finalized before they can be digitized. Finalizing all the draft maps and putting them into digital form are the two biggest needs of the wetlands inventory process in Oregon.

Further, although the inventory maps classify wetlands according to the Cowardin system based on major type, hydrologic conditions, and vegetation, the classification system does not include a wetland function and value assessment. The Oregon Method provides a way for wetland functions and conditions to be evaluated, but the resources required for performing the assessment will limit the speed with which the state's wetlands can be evaluated. For now, the Oregon Method is best suited for use in the local land use planning process. Eventually, when sufficient data are collected, the information can be used in wetland policy formulation and analysis at local, regional, and statewide scales.

The River Basin Studies program produces a document that can be of immense value to local planning and restoration/enhancement efforts. The program as it is implemented in Oregon also recognizes that the assessment process itself can be of great value to local planning

efforts, and brings in diverse groups. The process is an expensive one, however, and takes considerable time to complete, averaging two years for each study.

Having said that there are significant problems in the assessment field, it should also be noted that these problems have not escaped the attention of federal and state resource managers. Efforts are underway as an outgrowth of the FEMAT process to coordinate the assessment efforts of various federal agencies through an interagency task force.

Volunteer monitoring by citizens is one possibility for expanding the state's capability in assessment and monitoring. Such monitoring collects basic information but it also does much more: it operates as a network for distributing information, and fosters stewardship of the resource. Monitoring results can be dispersed easily through such a network. The success of the Citizen Lake Watch program, albeit on a small scale, has established that volunteer monitoring is a viable way to enhance the state's monitoring capabilities. ODFW's Salmon Trout Enhancement Program brings volunteers into the stream survey process.

Watershed Assessment:

Despite the state's emphasis on a watershed-based approach to address nonpoint source water quality problems, there is as yet no methodology for assessing watershed health status. The project at DSL is expected to produce such a methodology, and to apply it to all the state's watersheds. The resulting tool will be rather coarse and will be more suited for comparative analysis between watersheds than to intensive analysis of a particular watershed.

As part of its Aquatic Inventory Project, ODFW is beginning to develop methods of integrating their stream survey data with other kinds of field data to facilitate basin and watershed assessment. Other agencies should be involved in this effort.

RECOMMENDATIONS

1. DEQ should establish a GIS-based watershed monitoring protocol that will support its coordinated watershed planning and watershed enhancement projects. Both the state and federal agencies have committed to a watershed-based approach, and have devoted substantial funds to support that work. A monitoring program can assist in enlisting local support for the planning and enhancement work by bringing detailed local information to those who depend on the watershed. Without a monitoring program, it is extremely difficult to document that progress has been made. It is also difficult to compare the effectiveness of various approaches without quantitative assessment of impacts on water quality.

Substantial work has been done already in developing a biomonitoring component and in locating and establishing standards based on a paired-watershed approach. There is also underway a project at DSL to develop a watershed-appraisal method and to assess each of the state's watersheds. It is hoped that the results of this program can serve as a starting point for development of a watershed monitoring protocol. However, a tool that can be used

quickly to assess the relative health of the state's watersheds must be refined and expanded significantly for it to be a useful tool to measure progress over time. In particular, techniques must be refined so that they can track the effects of management measure implementation.

An important aspect of such a protocol would be the facilitation of links to programs that already collect data. Over time, it should be possible to develop the capability to exchange information electronically. It would make sense for such a system to incorporate a good percentage of the information already obtained by other agencies.

Incorporation of citizen volunteer efforts could be an important aspect of such a monitoring protocol. Volunteer testing, with appropriate technical backup, has been shown to be a good source of data. The Citizen Lake Watch program and many volunteer programs across the nation have clearly established this. In addition, volunteer monitoring has the added benefits of being a good way of developing awareness of the status of the water resource, of distributing information back to the involved members of the community.

2. DEQ should work with other agencies to develop a GIS-based coordinated monitoring effort that can provide easy access to information from other agencies.

While such a coordinated approach would need to be designed to support the objectives of numerous state and federal agencies, among state agencies, it makes sense for DEQ to take the lead. The state's GIS Service Center, part of the Department of Energy, has the technical capabilities to handle such a system, but probably not the ability to organize the agencies and agree on objectives.

COORDINATED WATERSHED PLANNING

Tillamook Bay National Estuary Project (EPA)
Oregon Watershed Health Initiative (WRD)
Columbia River Basin Fish and Wildlife Program (NWPPC)
Model Watershed Program (NWPPC)
Small Watershed Program (NRSC)
Resource Conservation and Development Program (NRSC)
Integrated McKenzie Watershed Management Program (LCOG)

DESCRIPTION

Coordinated watershed planning promises to be one of the most effective tools available for nonpoint source pollution control. Significant federal and state funds have been committed to this process. Most of the projects, however, are still in the early stages and have not yet achieved a track record.

The Tillamook Bay National Estuary Project is in its start-up phase. The Project is funded through EPA's National Estuary Program. Since there has been major assessment work done in Tillamook Bay in the past, the Tillamook Bay project will devote less of its resources to assessment than other projects around the nation. The program is based on the classic coordinated resource management planning concept of bringing all interests to the table to work out a comprehensive yet practical plan. The major constraint of the program is that funds can be used only for planning; funding for implementation must come from other sources. Proposals currently pending in Congress would expand NEP funding and allow grants to be used for certain types of implementation. Whether these proposals will eventually be adopted is difficult to predict.

The Oregon Watershed Health Initiative is founded on the same principles as the National Estuary Program, except the state program includes significant funds for implementation. The initial one-and-one-half years of the program will concentrate on the Grande Ronde basin and the combined Rogue and South Coast basins. Since the program is still in its initial stages, it is far too early to comment on its effectiveness. Since virtually all of the water-related state agencies are involved, it seems likely that the state will be able to avoid the problem of different agencies working at cross-purposes. The danger is that so much time will be consumed by coordination efforts, meetings, etc., that little time will be available for the other work that needs to be done. In particular, as has been discussed in the section on assessment, monitoring capability must be developed as quickly as possible so that the effectiveness of the restoration projects can be measured. Monitoring can be used to distinguish good projects from ineffective ones, and can document the beneficial impacts of the good projects.

The Northwest Power Planning Council's Model Watershed Program is one portion of its Columbia River Basin Fish and Wildlife Program, a multi-faceted program with the goal of protecting fish and wildlife, and their habitat, in the Columbia River system. The Model Watershed Program is another planning effort, although the emphasis is not on assessment or even devising strategies so much as it is on devising ways to implement plans and strategies which have already been developed. Oregon's Model Watershed is the Grande Ronde.

The Natural Resources Conservation Service administers two programs which embody the coordinated watershed planning concept, the Resource Conservation and Development Program and the Small Watershed Program. The Small Watershed Program provides funds and technical expertise for both planning and implementation. The program. Its main limitation is that due to funding limits, it can be three to four years before a project can begin.

The Natural Resources Conservation Service's Resource Conservation and Development Program is focused on economic development in resource-dependent rural communities, and in that respect it differs from the other coordinated watershed planning programs.

In the McKenzie watershed, EPA funding has supported the formation of a local watershed council as the initial stage of a comprehensive watershed planning process. One of the most significant achievements of Integrated McKenzie Watershed Management Program to date has been the development of a geographic information system data base specifically designed to monitor conditions in the watershed.

ANALYSIS

Coordinated watershed planning is a process that needs to occur in each of the state's watersheds, degraded or pristine. From a short-term water quality perspective, those watersheds which are degraded the most need to be addressed first. From a longer-term perspective, managing a watershed to prevent problems from occurring can be more cost-effective than dealing with problems after they develop. State funding thus far has targeted those watersheds where problems are most serious, with special attention to those providing habitat for salmonids. At the same time, passage by the state legislature of House Bill 2215 in 1993 dictates that state policy will foster the formation of locally initiated watershed councils regardless of their ecological status.

At the federal level, President Clinton's Clean Water Initiative identifies four factors that states should consider in establishing priorities for watershed management planning: (1) the presence within the watershed of threatened or impaired waters, especially those affected by nonpoint source pollution; (2) the need to protect highly productive, fragile, declining, or unique habitats, such as wetlands; (3) the degree of risk to the ecosystem and human health; and (4) the need to restore and/or maintain waters of special importance to communities, for example, valuable urban waterways.

Given the realities of limited funding, setting priorities for watershed planning is critical. The EPA-funded project underway at the Division of State Lands to develop a watershed assessment protocol and conduct a comparative assessment of all the state's watersheds will provide the information as to which watersheds have the most severe problems. In addition, there are other factors that play an important role in the targeting of both planning and implementation funds. Salmon habitat restoration and enhancement are explicit goals of both the state and federal government. Watersheds which are the source of drinking water supplies are likewise of special importance.

A final factor that should be considered in selecting watersheds for management planning is the extent to which other resources can be mobilized in the same watershed. The synergy that comes from focusing resources of federal, state, local, and private organizations can be an important contributor to the success of the planning effort.

Once watersheds are selected for coordinated planning, there must be a commitment on the part of the state to carry through with implementation. Further, there should be an explicit recognition on the part of the state that in some watersheds, implementation must continue for an extended period. Plans mean nothing if they sit on a shelf. Partners devote considerable time, money, and energy to the planning process, and must be rewarded with a sustained commitment to implementation. Part of the planning process does involve identifying resources for implementation, and documenting the need for specific projects. A successful plan will therefore be one which explicitly builds in a strategy for financing the plan's implementation. DEQ and the other state agencies involved in the planning process need to assure partners from the onset of their commitment to implementation of the resulting plan.

The NEP is limited by the express prohibition against using program funds for implementation, although several proposals currently pending before Congress would change or remove that restriction. The Watershed Health Initiative has a substantial implementation component, but funding beyond June of 1995 is not assured. The state's budgetary problems, as well as the biennial legislative process, combine to make it difficult to project into the future.

RECOMMENDATION

DEQ should work with other state agencies to ensure that plans developed through the coordinated watershed planning process have adequate funds for implementation, and to assure a sustained commitment to projects which have been initiated. Restoring health to the state's watersheds cannot be accomplished with a "quick fix" approach. There are projects which can be done quickly, for example screening water diversions to protect fish and fencing riparian areas to protect vegetation and soil, but these projects alone will not be enough.

EDUCATION

The Stream Scene (ODFW)
Project WILD and Aquatic Project WILD (ODFW)
Public Education Program (ODA)
Environmental Education Grants (EPA)
OSU Extension Service
Boating Safety Education Program (Marine Board)
Governor's Watershed Enhancement Program (GWEB)

DESCRIPTION

Two programs are designed primarily for use in the state's schools. The Stream Scene was developed in Oregon, and provides a variety of curriculum activities for students. It focuses on the stream bed, with some emphasis on riparian areas. Project WILD and Aquatic Project WILD also provide curriculum activities for elementary and secondary students. This program is in use in a number of states.

The Governor's Watershed Enhancement Board (GWEB) has funded a project to develop a similar curriculum emphasizing the upland ecology and its importance to watershed functioning. GWEB also provides funds for other educational activities. Its funding criteria highlight projects which focus on watershed-scale processes.

The OSU Extension Service's activities span a broad range of subject areas and target audiences in the agricultural field. Many of its activities, such as written material, are educational in nature, while others are more focused and fit more closely the definition of technical assistance. The Extension Service, with its county offices and its network of contacts in the agricultural community, is one of the most important educational resources in the agricultural sector.

The Oregon Department of Agriculture also has a public education program specifically focused on water quality which employs a variety of educational techniques and related demonstration projects. This program is aimed at the smaller farms, which may not be as well-connected to the agricultural network as the larger producers. The program also targets watersheds with more serious water quality problems. The smaller farms appear to be the ones hardest to reach and the slowest to adopt new practices.

The Oregon Department of Agriculture successfully used education as a means of virtually eliminating irrigation return flows from the state's container nurseries. The Container Nursery Irrigation Water Management Program

The Oregon Department of Agriculture is also leading the state's development of a Pesticide State Management Plan addressing pesticides which have been found to be a threat to

groundwater. The plan is being developed pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the primary federal legislation regulating pesticides. Although technically a regulatory effort, the plan is expected to rely heavily on educating pesticide users, at least initially.

The Oregon State Marine Board sponsors a Boating Safety Education Program. Although it does provide some information relevant to pollution control (e.g., the locations of pumpouts and dump stations), the primary emphasis is boating safety rather than environmental impacts of boating.

ANALYSIS

An EPA-financed study of effective nonpoint source public education and outreach program identified those factors which educators saw as the most crucial elements of success. The most common elements of success included:

- Framing the problem in terms of individual and area wide issues (i.e., impacts on fish, irrigation management, erosion control, and individual economic concerns) tends to be more effective than emphasis on generalized environmental concerns such as water quality.
- Complete information must be provided to watershed or area residents regarding the nature of the problems and actions required to correct them. If residents have a better understanding of the nature and causes of a problem and the steps required to correct it, the chances of high participation in implementing solutions increase.
- Adequate technical assistance is necessary to implement best management practices and other control strategies. Resources, e.g., staff, must be available to deal with the large number of requests for technical assistance generated by the information and education program.

Many educational materials have already been developed, by EPA, private organizations, and other state and local governments. Puget Sound has developed materials which are aimed at the northwest ecosystem.

In Oregon, the agricultural community receives the bulk of educational services related to nonpoint source pollution control. The state's strategy of targeting small farms and watersheds with water quality problems seems a sound one, as does the technique of combining demonstration projects with tours, newspaper articles, workshops, and other methods.

Few coastal local governments have any kind of education program relating to nonpoint source pollution. Local governments in many coastal communities are small, and focused primarily on those planning and regulatory functions that are mandated by state law. Few of

these governments have the financial resources to initiate non-required programs on their own.

Yet there are specific kinds of nonpoint source pollution that could be addressed by local governments, in particular those generated by households. Septic systems are prevalent in the coastal zone. Many new residents there have never dealt with septic systems before and need specific instructions regarding their operation and maintenance. Source reduction of household and yard chemicals could significantly reduce loadings of nutrients and toxics in those areas served by sanitary sewers. Population growth at the coast, a trend that is likely to continue, will require convincing long-time residents that some of the practices they used when density was low are likely to strain the environment's assimilative capacity as population grows.

Given the increase in population, there will also be an increase in construction. In this area, many coastal communities have developed some expertise in erosion control, in connection with their own and the state's permit requirements. However, the state regulates only projects which disturb five or more acres.

Many coastal residents are also boaters, and education programs could emphasize the importance of proper handling of marine waste. The Oregon State Marine Board does have a boater education program, although its primary focus in the past has been on boating safety. Funding from the Clean Vessel Act grant program will provide funds for the development of materials focused on marine sewage.

Although only coastal communities were surveyed, it seems likely that the same situation prevails among smaller communities in the rest of the state. The larger metropolitan areas, those subject to the Clean Water Act's storm water provisions, currently have more of an incentive to implement educational programs that foster source control. The storm water requirements have put pressure on the larger communities to develop creative new ways to reduce pollutant loads in storm water. Larger communities also have more resources to deal with the problem.

RECOMMENDATIONS

1. **DEQ should establish a cooperative education program with small local governments to reduce household sources of nonpoint pollution.** An important aspect of such a program would be the involvement of local officials and citizens in the actual planning of such a program so that it can be tailored to specific problems in the region. Such a program can be linked to volunteer monitoring. There are already numerous resources available for community education. As recommended by the EPA study, these efforts will be most successful if local residents are provided with as much information as possible about problems in their local communities, and if those problems are linked with issues they can identify with. Clean drinking water and salmon recovery are both good examples of issues that local people can relate to, and also can have an impact on at the local level.

2. DEQ should work with the Oregon State Marine Board, public and private ports and marinas, and boater groups, to develop boater education materials focusing on the environment and the consequences of marine sewage, fuel spills, boat maintenance substances, and turbidity, and fish waste. Oregon probably has less of a problem from recreational boating than states on the east coast or Washington and California due to the much smaller number of boaters. Yet that number is growing every year. Building an awareness of the impacts of marine sewage and encouraging boaters to use the pumpouts and dump stations which will be constructed with the Clean Vessel Act funds can prevent these problems from ever reaching the proportions faced by more populous states.

3. DEQ should develop partnerships for education with specific interest groups aimed at reducing the nonpoint pollution from sources associated with those groups. Oregon's Section 319 program has funded such a partnership with the Oregon Cattleman's Association. Groups like this already have newsletters, regularly scheduled meetings, social functions, regular mailings, and a variety of other links between group members. Partnerships with such groups can take advantage of these links as well as the credibility that goes along with information from a trusted source. This kind of partnership will also build and strengthen lines of communication between the groups and DEQ itself. DEQ can use these lines of communication to provide detailed information about the nature and specifics of problems associated with the groups' activities. DEQ may also learn more about the specific reasons for resistance to change, and can provide appropriate technical assistance. Additionally, these groups may decide that self-regulation is an option preferable to government intervention, as occurred with the state's container nurseries. Finally, partnerships with such groups can help to build support for regulatory programs if those programs target those who have failed to heed the message of the educational program.

DEMONSTRATION PROJECTS

Blue Mountains Natural Resources Institute
Oregon Department of Agriculture Demonstration Projects
Governor's Watershed Enhancement Program (GWEB)

DESCRIPTION

Projects which demonstrate the benefits of restoring and enhancing Oregon's watersheds are a major focus of the Governor's Watershed Enhancement Program. The program has been most active east of the Cascades.

The Oregon Department of Agriculture's demonstration projects are part of the overall public education strategy described in the previous section. The projects are generally small scale and serve to introduce new and appropriate technology. A good example is the "nose pump" project that demonstrated a low-cost way to keep livestock out of nearby streams but still use the streams as a source of water for the animals.

The Blue Mountains Natural Resources Institute has a specific region of national forest land set aside for demonstration projects. These projects provide visible evidence of the value of a variety of protection, restoration, and enhancement techniques.

ANALYSIS

Demonstration projects can play an important role in an overall watershed management strategy. Such projects not only demonstrate the viability of sound management practices; they also carry with them the credibility of the individual who agrees to participate in the demonstration. As with educational efforts, the effectiveness of demonstration projects can be enhanced by involving targeted interest groups in their development and implementation.

RECOMMENDATION

DEQ should develop demonstration projects in partnership with specific interest groups that aim to reduce the sources of nonpoint pollution associated with those groups. The benefits of working with such groups in developing educational projects would be just as applicable to demonstration projects.

TECHNICAL ASSISTANCE

Technical Assistance Program (NRSC)
OSU Extension Service
Soil and Water Conservation Districts
Forestry Incentive Program
Planning Assistance to States (ACOE)
Partners for Environmental Progress (ACOE)

DESCRIPTION

The only programs described here are those which have technical assistance as one of their major functions. Most of the federal and state agencies involved in resource management provide technical assistance to other agencies and to the public.

The Natural Resources Conservation Service's Technical Assistance Program is linked to the CFSAs cost-share programs discussed in the next section. Many of the cost-share programs require development of a conservation or resource management plan, and NRSC provides the technical backup needed to develop those plans. NRSC works closely with the other two programs listed above, the OSU Extension Service and the Soil and Water Conservation Districts. Together these agencies provide the agricultural community with an array of technical services that in recent years have focused more heavily on water quality, although they still have increased and more efficient production of farm commodities as a goal as well.

The Forestry Incentive Program provides funds to the state Department of Forestry enabling it to offer technical assistance to small woodlot owners. This program emphasizes production but incorporates water quality goals as well.

ANALYSIS

The agricultural community has had excellent access to technical assistance. Whether this will continue depends in part on actions taken at the federal level. The link to the cost-share programs is very important because it takes advantage of the motivation to receive the cost-share funds.

For the small woodlot owner, the Department of Forestry is an excellent resource. The larger interests in forestry also have access to this assistance, but probably need it less than the smaller timber producers. The high rate of harvest on small woodlots in the past few years is evidence, though, that economic forces (i.e., high timber prices) are still more powerful than the government's efforts to protect waterbodies and forest ecosystems.

There are few federal or state programs providing technical assistance in urban areas,

although the Section 319 program is supporting projects that encourage composting and other source reduction efforts.

The State Marine Board provides technical assistance in the form of engineering review of specifications for construction projects, including restrooms, floating restrooms, pumpouts and dump stations.

RECOMMENDATION

DEQ should work with local governments to expand the technical assistance available to individuals in urbanized areas, in particular those not covered by the storm water regulatory programs. Working with local governments can provide links to local stewardship and conservation groups, which can help identify specific projects that would be appropriate and effective in source reduction efforts. As with education programs and demonstration projects, the closer the links to local groups, the greater the likelihood of success in reaching and persuading individuals to modify their activities which affect the land.

COST-SHARE ASSISTANCE

Agricultural Conservation Program (CFSA)
Conservation Reserve Program (CFSA)
Wetlands Reserve Program (CFSA)
Rural Clean Water Program (CFSA)
Soil and Water Grant Program
Water Quality Incentive Program
Emergency Conservation Program
Riparian Tax Incentive Program
Boating Facility Grants Program
Clean Vessel Act Grant Program
Boating Facility Maintenance Assistance Program
Stewardship Incentive Program
Forestry Incentives Program
USFWS Partners for Wildlife Program

DESCRIPTION

The great majority of cost-share programs are those focused on agriculture and administered by the Consolidated Farm Services Agency (formerly the Agricultural Stabilization and Conservation Service) of the U.S. Department of Agriculture. The largest is the Agricultural Conservation Program (ACP), which brings in federal money to the state annually. The Water Quality Incentive Program (WQIP) is actually a part of the ACP program, but with a more narrow water quality focus. All parts of the ACP program provide a portion of the cost of specific conservation practices, many of which are specifically designed for reducing runoff of soil, nutrients, and pesticides.

The Conservation Reserve Program's purpose is to actually remove acreage from crop production, and cost-sharing is used to assist with the costs of conversion to a reserve status. Limited to lands which qualify as highly erodible, this program essentially pays farmers for not producing.

The new Wetlands Reserve Program is similar in design, although the government will purchase a permanent interest in the property rather than leasing it for a number of years as is done in the CRP. The program is new to Oregon in 1994, and allocation of funds has not yet taken place. Whether the program adds significantly to the state's wetlands remains to be seen.

The Rural Clean Water Program is an experimental program that is being phased out. In Oregon, this program was used primarily to fund structural approaches to animal waste management problems, in particular in the dairy industry in the Tillamook watershed.

The Forestry Incentive Program is another CFSA-administered program, but its focus is on tree production rather than crops. To receive cost-share benefits, a landowner must have a Forest Management Plan that takes into consideration other resources, including water quality, and landowners must ensure that water quality is maintained during and after a site is prepared for planting. The primary purpose of the program, however, is timber production rather than environmental improvement.

The Stewardship Incentive Program is a relatively new cost-share program aimed at forest lands. The program started in Oregon in 1992. Signups and payments are handled through CFSA, but the state Department of Forestry is in charge of program administration at the state level. As in the FIP program, the SIP program cost-shares the establishment of timber production on private lands. A stewardship plan that takes into account all the land's natural resources is a requirement for receipt of cost-share funds.

The State Marine Board administers all of the cost-share programs in Oregon that relate to boating. The Boating Facility Grants Program and the Boating Maintenance Assistance Programs share costs with public entities rather than private landowners, so are not true cost-share programs in the classic sense. Both programs have goals far broader than water quality, but can be used to help fund restrooms, pumpouts and dump stations. The new Clean Vessel Grant program is administered by the U.S. Fish and Wildlife Service, and will be used initially to survey pumpout and dump station facilities in the state. Funds will then be made available for construction of pumpouts and dump stations, both at public and private facilities.

The state also has a Riparian Tax Incentive program that gives tax relief to owners of riparian lands which meet certain criteria, if the owners agree to develop and abide by a management plan for those lands. The program is rarely used.

ANALYSIS

The Rural Clean Water Program, which is now in its final stages, was designed to test various models for implementing best management practices for nonpoint source pollution control. An intensive study of the program by researchers at the University of North Carolina has identified the element of cost-share payments as the single most important factor associated with the voluntary adoption of desired management practices by the agricultural community.

The federal agricultural cost-share programs have now incorporated environmental conditions, in particular integrated resource management plans, as a prerequisite for the receipt of cost-share funds. This change was in response to criticism that agricultural policy was acting counter to environmental concerns.

Agricultural cost-share programs bring significant numbers of federal dollars to the state's economy and encourage good management practices. Despite the large size of these

programs, their funds are usually exhausted within a few months. There is obviously a great demand for more agricultural cost-share funds.

Cost-share programs outside the agricultural sphere are limited. The Forestry Incentives Program does provide help to the small woodlot owner for certain practices. The Partners for Wildlife Program assists projects that enhance wildlife habitat, but the program is small and is hampered by the difficulty in obtaining water storage permits. The Clean Vessel Act grants is an important source for funds to share the cost of construction of marine sewage pumpouts and dump stations.

Cost-share programs make the most sense where the cost-shared activity is one which private property owners are unlikely to implement on their own due to cost considerations. One area where no cost-share program exists is inspection of septic systems. The Section 6217 coastal program will require regular inspection of septic systems in the coastal zone. The cost of such a program would seriously strain DEQ's financial resources. Imposing fees to cover the cost of mandatory inspections will be extremely unpopular with coastal residents. A cost-share program could reduce the impact of both of these negative factors.

RECOMMENDATION

DEQ should explore the possibility of a state-financed program to share the costs of septic system inspections with private property owners. Such a program would respond to the Section 6217 mandate for periodic inspections of operating on-site disposal systems. The program would need to be developed with licensed on-site system inspection and maintenance contractors, who would benefit from the increased number of inspections under such a program, and also from the additional pumping, maintenance, and repair operations that the inspections would generate. Such a program would be more effective if it included financial incentives for property owners to conduct regular inspections. It would also be important to have regulatory authority to conduct periodic inspections of on-site systems where property owners choose not to participate in the cost-share program, and to charge the property owner for the cost of the inspection.

STEWARDSHIP

Adopt-a-River Program
Salmon Trout Enhancement Program
Citizen Lake Watch Program

DESCRIPTION

The only programs described here are those where volunteer efforts are a major program component. Virtually all of the programs in this report operate to foster stewardship by local citizens of their watershed's natural resources.

The Adopt-a-River Program, originally developed by an ODFW employee in Medford, is now being handled by the Oregon State Marine Board and the private nonprofit organization SOLV (Stop Oregon Litter and Vandalism), the organization which helped Oregon pioneer regular public beach volunteer cleanups. In its early stages, the program is involving many state agencies in its design and planning phase. Its purpose will be to regularly maintain the banks of rivers and streams and keep them free of debris.

The Salmon Trout Enhancement Program makes use of volunteer resources in both riparian survey work and other types of fish enhancement projects. The program logs a very impressive number of volunteer hours every year. In addition to adding to the pool of knowledge about the state's streams, the programs act as a conduit for information about the best techniques and the latest research into stream ecology.

The Citizen Lake Watch Program is another successful volunteer monitoring effort. 25 lakes have been monitored on a regular basis over the past year, and more are scheduled to be brought into the program with increased funding from Section 319 of the Clean Water Act.

ANALYSIS

The concept of stewardship is one which is easy to promote in the abstract, and which few would oppose in the abstract. And if the idea is to develop a sense of stewardship by private citizens at the local level, what is the appropriate role for government? Probably the best way to promote local stewardship is to provide many diverse opportunities for citizens to be involved. Volunteer monitoring programs, organizing efforts, and so forth can give individuals a range of options for ways to become involved.

RECOMMENDATIONS

1. DEQ should expand the Citizen Lake Watch program to include more lakes. The program has already shown that volunteer monitoring data can be very helpful. DEQ has already obtained funds to support a modest increase in the number of volunteers and lakes

included in the program. The addition of a technical assistance program aimed to lakeshore homeowners can benefit from the specific data gathered by local volunteers. The long-term goal should be the inclusion of all lakes in the state in the monitoring program.

2. DEQ should explore the possibility of developing a pilot program of volunteer monitoring of specific parameters of nonpoint source pollution. There is great public interest in the possibility of such a program, as is evidenced by the appearance of monitoring efforts by nongovernmental organizations, such as the Coastwatch program sponsored by the Coast Range Association, and the citizen monitoring of water quality by local groups in the Umpqua basin and Portland area. Such a program, developed in conjunction with local officials and interested groups, would operate on the same principles as the Citizen Lake Watch program, providing training and technical assistance for volunteers, and informing volunteers of monitoring results. It would make sense for such efforts to be organized on a watershed basis, and to initiate these efforts in one of the coastal watersheds.

WATERSHED ENHANCEMENT PROJECTS

Northwest Economic Adjustment Initiative
Governor's Watershed Enhancement Board
Oregon Watershed Health Initiative
Bear Creek TMDL Program
Tualatin TMDL Program

DESCRIPTION

The Northwest Economic Adjustment Initiative, sometimes called Jobs in the Woods, is a new program of federal aid targeted at formerly timber-reliant communities. A major portion of the funds go to the U.S. Forest Service, for assessment and enhancement activities, with much of the actual field work to be done by hiring individuals in targeted communities. Community Economic Revitalization Teams (CERTS) at the regional and state level are comprised of federal, state, and local representatives, and develop an Implementation Plan for use of the funds. Within the region composed of Washington, Oregon, and Northern California, the Forest Service will receive \$17 million for watershed assessment, and \$15 million for watershed restoration. The Bureau of Land Management will receive \$7 million for similar activities, and the EPA and U.S. Fish and Wildlife Service have smaller allotments of funds.

Oregon's Watershed Health Initiative is both the newest and the largest program of watershed enhancement now operating in the state. Targeted at the Grande Ronde basin and the combined South Coast/Rogue basins, teams of natural resource specialists are coordinating the funding of numerous on-the-ground implementation efforts identified during previous planning efforts. The teams consist of employees from most of the state's natural resource management agencies. The program's structure was designed to improve coordination among the many state agencies involved in implementation.

The Watershed Health Initiative builds on the efforts of the Governor's Watershed Enhancement Board, which has been providing matching grants for watershed enhancement and education projects since 1988. The Governor's Watershed Enhancement Program is a statewide program, but has placed a special emphasis in its early years on projects in Eastern Oregon. In addition to the projects it has funded, every two years the GWEB has sponsored a major conference devoted to an aspect of watershed protection and restoration.

Significant water quality problems have been the impetus for the development of management plans which include significant enhancement work for the Tualatin Basin and the Bear Creek Basin of the Rogue River. Violation of water quality standards led to the development and imposition of Total Maximum Daily Loads in each of those basins. Although this program is regulatory in nature, the management plan that was developed relies heavily on demonstration projects, public education, and watershed enhancement activities to reduce the

inputs of nonpoint source pollutants.

ANALYSIS

The Governor's Watershed Enhancement Board has played an important role in the growing awareness of watersheds and the many valuable roles they play in the environment and the economy. The Watershed Health Initiative of the 1993-95 biennium provided a large infusion of funds, which, in addition to providing financing for targeted projects, triggered the development of many local watershed councils.

However, as funding for watershed enhancement projects has increased, so have criticisms of how those funds are used. Considerations of both effectiveness and equity require that funds be distributed based on an ordered set of priorities. An ordered set of priorities depends, in turn, on an assessment of current watershed conditions and participation of all watershed stakeholders in a planning process. Without these prerequisites, efficiency will likely suffer and conflict will certainly result.

RECOMMENDATION

DEQ should ensure that the enhancement projects it supports financially have been developed taking into consideration both a recent watershed assessment and priorities developed by any existing watershed council. This will promote efficiency and equity in the use of funds, as well as provide a continuing incentive for local watershed councils to take an active role in prioritizing restoration and enhancement work within the watershed.

CONCLUSIONS

1. Voluntary efforts at nonpoint source control have played a central role in Oregon's strategy to address nonpoint source water pollution. For a variety of reasons, voluntary methods will continue to be the focus of most nonpoint source control efforts. Regulatory programs have come under increasing fire at both the state and federal levels. Efforts to consolidate and simplify regulations are far more likely to be successful than efforts to extend the reach of environmental regulations.

Another reason for the continued emphasis on non-regulatory efforts is that many of the activities which generate nonpoint pollution are very common and would be extremely difficult to regulate directly. Driving a car or truck, for example, can generate a variety of nonpoint pollutants, from airborne hydrocarbons and lead in exhaust fumes, to particles of cadmium, copper, and zinc from tires and brake pads. Regulating the activity that generates the pollutants, i.e., driving, is obviously not the answer. In this example, persuading car manufacturers to voluntarily reduce the cadmium, copper, and zinc in tires and brake pads is one solution.

Similarly, household activities that generate polluted runoff, such as application of lawn chemicals, would be difficult to regulate, but education about the impacts of these chemicals and technical assistance in implementing alternatives are likely to show results. Chances of success will be enhanced where a link can be established between polluted runoff and a local problem, such as declining numbers of native wildlife.

The nature of activities which generate polluted runoff is so diverse that no one solution is possible. Voluntary efforts can be tailored to discourage pollutant-generating activities and encourage alternatives approaches.

2. The effort to combat nonpoint source pollution is not adequately funded, and new funding sources need to be developed if the effort is to be successful. The level of funding devoted to prevention and control of nonpoint source pollution is small compared to the large public investment of the past several decades in the construction and upgrade of many publicly owned sewage treatment works. To achieve the same reduction in nonpoint source pollution as has been achieved for point sources will require significant increases in public funds.

However, political pressure to cut budgets makes a large increase in funding for nonpoint source control highly unlikely. If anything, the resources allocated to pollution control are likely to be reduced, not increased. In order to make progress in such a climate, public agencies are going to have to devise new approaches. One way to leverage limited public funds is to make increased use of volunteer efforts. This is discussed further below.

3. The use of geographic information systems (GIS) is not nearly as widespread in state government as it is in private industry, the academic community, and in some cases even local government. There are software programs (e.g., ArcView 2) which are not difficult to master yet will vastly improve the usefulness of information that already exists. DEQ should make more of an investment in this technology as a tool for integrating various aspects of watershed resource management.

There are institutional barriers to the widespread implementation of GIS within state government. Some managers are not aware of the powerful tool that a GIS system provides in understanding natural systems. The technology is relatively new, and those without recent academic exposure may not have had the opportunity to familiarize themselves with this tool.

In addition, because GIS systems are computer-based systems, there are costs for both hardware and software. Another expense is training: the most widely-used system in government is ArcInfo, which requires significant training and experience to be used effectively. Another program, however, ArcView, can make use of ArcInfo data layers in a far more user-friendly format. Computer literacy is nearly universal in resource agencies, and ArcView can be mastered far more easily and quickly than ArcInfo.

Another barrier to widespread use of GIS is that choosing a system and establishing it for

agency-wide use is usually a very large task requiring expertise as well as money. Data layers must be assembled, and there are questions of scale which must be addressed by someone proficient in GIS use. Thus there are significant front-end expenses in setting up a system.

Geographic information systems are such powerful tools for resource management, however, that the investment in time and money is clearly warranted. The state will be lagging behind industry and academia due to its late start in the field, but that gap should not be allowed to get any larger.

4. Monitoring of various kinds is done by a variety of state and federal agencies, but there is very little compatibility between data systems. Two agencies with different missions may be gathering similar data, but each uses exclusively its own data. As indicated in the section on monitoring and assessment, this problem has been recognized and agencies are working together to eliminate the barriers to sharing of data. Without a continued emphasis on data coordination as a priority goal, however, the effort could lose momentum.

Monitoring is a specific activity where members of the public as well as students and their teachers are eager to participate. Some successful volunteer programs do exist, but within DEQ, there remains significant skepticism about the quality of volunteer data. This raises the fundamental issue of whether volunteers have a role to play in the gathering of water quality data.

Citizen Lake Watch volunteers have provided lake water quality data for several years. The program is associated with Portland State University, which provides technical assistance and data analysis.

Conservation and environmental organizations have begun extensive volunteer monitoring efforts focused on activities of concern in the coastal basins. CoastWatch has recruited volunteers to adopt one-mile segments of nearly the entire Oregon coast. The volunteers will monitor their stretch several times a year and keep tabs on development, land use activities, trash and debris, wildlife habitat, and other parameters.

The Coast Range Association has collected data from local offices of the state Department of Forestry regarding application of pesticides on forest land. The resulting data have been entered into a geographic information system to produce a map showing the cumulative application of forest chemicals within a watershed.

The state needs to find a way to incorporate the results of efforts like these into its monitoring program for nonpoint pollution. Important issues like quality assurance, data compatibility, and project design could best be resolved by early cooperation between state agencies and private organizations.

5. Education and technical assistance will remain the most cost-effective methods for

addressing many nonpoint problems. By stressing positive alternatives and solutions, state government can play an important leadership role and can have an impact on problems which result from the cumulative impact of numerous small pollution-generating activities.

6. Economic incentives and disincentives can be used to a far greater extent to address certain nonpoint pollution problems. While cost-share programs are generally successful in inducing farmers and others to implement pollution prevention practices, these are also among the most expensive programs. Other cost signals could be used to encourage or discourage various management practices. For example, an increased tax on fertilizers would lead to decreased use of the product, as well as generate funds which could be used to address nonpoint source problems.

There are only a few programs at the state level which use economic incentives or disincentives to achieve implementation of nonpoint source control. One is the riparian tax credit program. The state can and should do more in this area.

7. Enforcement programs are generally the most expensive way for government to control nonpoint source problems. For this reason, as well as concerns about equity and fairness, enforcement is rarely used as a tool for nonpoint source control, and only to address problems that have not been amenable to voluntary control methods. For some individuals, as well as some industries, voluntary methods are insufficient. In these instances, it is important for the state to be able to follow up with enforcement activity.

8. There needs to be a concerted effort on all fronts to address nonpoint source problems. Many individuals and businesses have the attitude that the problem is not one they created, and they have no part in the solution. Until there is broader understanding of the fact that most, if not all, activities on land have the potential to generate polluted runoff, progress will be slow. On the other hand, when there is a broad realization that society is currently paying the costs of nonpoint pollution in dirtier streams, lakes, estuaries, and rivers, reduced species richness and diversity, and degraded habitat for fish and other wildlife, there will be more pressure for those costs to be internalized and paid for by those performing the activities which cause nonpoint problems.

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Agricultural Conservation Program
Agency	U.S. Agricultural Stabilization and Conservation Service
Contact Person, Address, Phone	Elizabeth (Betty) L. Lissman State Program Specialist Oregon State ASCS Office 7620 SW Mohawk, PO Box 1300 Tualatin, OR 97062 (503) 692-6830 x228
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	A1 - Erosion and Sediment Control Management Measure A2 - MM for Facility Wastewater and Runoff from Confined Animal Management (Large Units) A3 - MM for Facility Wastewater and Runoff from Confined Animal Management (Small Units) A4 - Nutrient Management Measure A5 - Pesticide Management Measure A6 - Grazing Management Measure A7 - Irrigation Water Management Measure W2 - MM for Restoration of Wetland and Riparian Areas W3 - MM for Vegetated Treatment Systems
Program Authorities (laws, ordinances)	Soil Conservation and Domestic Allotment Act, Sections 7 - 15, 16(a) and 17; Agriculture and Consumer Protection Act of 1973, Title X; Food and Agriculture Act of 1977; Agriculture, Rural Development, and Related Agencies Appropriations Act, FY-79; Energy Security Act of 1980, Section 259.
Program Description/ Objectives	<p>The Agricultural Conservation Program (ACP) provides direct cost-share payments to individual landowners for implementation of conservation measures designed to control erosion and sedimentation and to improve water quality.</p> <p>The four principal program objectives for the ACP plan for Oregon are:</p> <ul style="list-style-type: none"> • To solve the highest priority conservation problems which cause a reduction in the productive capacity of the State's land and water resources or impairment of the water quality of streams and rivers;

	<ul style="list-style-type: none"> • To obtain maximum public benefits for public funds expended; • To conserve and protect soil, water, woodland, wildlife and wildlife habitat which otherwise would not be accomplished; and • To coordinate ACP with program objectives of other natural resource agencies to the extent practical, using the Coordinated Resource Management (CRM) approach.
Geographic Scope	Statewide, although reimbursement for certain practices is limited to specified counties.
Public Assistance Components:	
Type	Cost-share payments up to \$3,500 per year. The percentage of federal reimbursement varies depending on the practice, but most are reimbursable at 75% of average cost.
Number	1,555 participants in Oregon in FY-92.
Eligibility criteria	<p>Eligible practices include:</p> <p>Establishment or improvement of permanent vegetative cover, contour and terrace systems; installation of pipelines, storage facilities, and other measures intended to provide erosion control on range or pastureland; installation of water impoundment reservoirs for erosion control, conservation, and environmental and wildlife enhancement; stabilization of streambanks; agricultural waste control facilities for dairy farms; establishment of reduced tillage and no-till systems; planting trees and shrubs and improving timber stands for protection against wind and water erosion and to protect trees for timber production; and development of new or rehabilitation of existing shallow water areas to support food, habitat and cover for wildlife.</p>
Public Education Components:	Not applicable.
Written/video	
Target audience	
Number distributed	
Method of distribution	
Scheduled/planned	
Seminars, workshops	
Target audience	
Dates and attendance	
Scheduled/planned	

Funding:**Amount**

\$3,531,302 in cost-share payments issued in Oregon for period 10/01/92 - 9/30/93 (down from \$3,976,725 in previous 12-month period).

Source

Appropriations, U.S. Congress.

Timing

Annual.

Coordination with other agencies

A state Agricultural Stabilization and Conservation committee and a state Conservation Review Group develop an annual state ACP plan. County Review Groups participate in setting statewide program goals. ASCS works closely with the Soil Conservation Service in administering this program; typically SCS provides technical assistance in establishing a conservation management plan and in applying the conservation practices for which cost-sharing is available. ASCS also works closely with local Soil and Water Conservation Districts, the U.S. Forest Service, the Extension Service, DEQ, EPA, ODF, and ODFW.

Program effectiveness:**Standards applied**

Statewide program goals are established for the ACP program. Detailed statistics are maintained to enable comparison of costs per acre and costs per ton of soil conserved by the various practices for which cost-sharing is offered.

Monitoring/assessment of program**Institutional analysis:****Most successful aspects****Problems experienced, e.g.:**

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Adopt-a-River Program
Agency	Oregon State Marine Board
Contact Person, Address, Phone	Paul Donheffner, Director Oregon State Marine Board 435 Commercial Street NE Salem, OR 97310 (503) 373-1405 x244
Watershed Management Program Element	8 - Stewardship
EPA Management Measures	U9 - Pollution Prevention Management Measure
Program Authorities (laws, ordinances)	HB 2487 (1993 Legislature).
Program Description/ Objectives	The 1993 Oregon Legislature directed the State Marine Board to implement an Adopt-a-River program statewide. The Marine Board Director is working with SOLV (Stop Oregon Litter and Vandalism, a private group which has been involved in organizing and training volunteers for beach cleanups and oil spill response), and federal, state, and local agencies to plan the program. A Steering Committee has been convened and is attempting to locate funding to cover the projected budget of \$100,000 annually, and developing guidelines for program operation on state, federal, and private land. Although details are still to be worked out, it appears likely the program will contract with SOLV for the provision of volunteer coordination and publicity. The program will likely begin operations in the spring of 1994.
Geographic Scope	Statewide.
Public Assistance Components: Type Number Eligibility criteria	Not applicable.
Public Education Components:	Not yet developed, but public education will be a component.

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

Approximately \$100,000 per year will be required.

Source

Not yet determined; probably federal and state funds.

Timing

Annual.

**Coordination with
other agencies**

The U.S. Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife, and Oregon Parks Department have been actively involved in the program planning. The program will need to coordinate with the multiple jurisdictions in which it will operate. There are plans to tie in with grassroots efforts which are already working to clean up some local rivers.

Program effectiveness:

As the program is not yet underway, it is too early to assess its effectiveness.

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

The legislation authorizing the Marine Board to establish an Adopt-a-River program did not provide any funds to do so.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Aquatic Inventory Project
Agency	Oregon Department of Fish and Wildlife
Contact Person, Address, Phone	Kim K. Jones Research and Development Section Oregon Department of Fish and Wildlife 850 SW 15th Street Corvallis, OR 97333 (503) 737-7618
Watershed Management Program Element	2 - Assessment
EPA Management Measures	W1 - MM for Protection of Wetlands and Riparian Areas W2 - MM for Restoration of Wetlands and Riparian Areas
Program Authorities (laws, ordinances)	No specific statutory mandate.
Program Description/ Objectives	<p>The Aquatic Inventory Project, which began in 1989, is designed to provide quantitative information on habitat condition for streams throughout Oregon. This information can then be used to provide basic information for biologists and land managers, to establish monitoring programs, and to direct or focus habitat restoration efforts.</p> <p>General information about an area, primarily from maps, is gathered in the office before field observations begin. Survey crews then collect detailed information about individual stream reaches. Data include channel form, valley form, valley width index, land form, streamside vegetation, land use, stream temperature, and stream flow. Channel habitat units are described by type (pool, glide, riffle, rapids, cascade, steps) on the basis of channel bedform, water surface slope, and flow characteristics. Data is gathered about each habitat unit, including active channel width and height, terrace width and height, depth, substrate composition, bank erosion, and complexity of woody debris. A quantitative estimate of wood volume and distribution is made using a standardized methodology.</p> <p>A riparian inventory provides quantitative information on species composition, abundance, and size distribution of</p>

vegetation in the riparian zone.

Priorities for survey areas are determined in the spring by district staff and Portland headquarters staff for assessments during the summer. Priorities include the presence of species which are sensitive or which are proposed or listed as threatened or endangered under federal and state Endangered Species laws; areas targeted for habitat restoration projects; and areas where large scale habitat change is anticipated due to major land use changes. In addition, some survey work is done in each geographic region in the state even if none of the other priorities apply.

Geographic Scope

Statewide. So far, 2,500 miles of 35,000 stream miles in the state have been inventoried.

Public Assistance

Not applicable.

Components:

Type

Number

Eligibility criteria

Public Education

Not applicable.

Components:

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

Approximately \$400,000 per biennium from general funds; \$450,000 per biennium from Restoration and Enhancement funds.

Source

ODFW general budget funds and Restoration and Enhancement funds.

Timing

Biennial.

**Coordination with
other agencies**

The methodology was designed to be compatible with other stream habitat inventory and classification systems, especially that of the U.S. Forest Service and the Bureau of Land Management.

Program effectiveness:

Standards applied

The program includes a quality control and ground truthing component that repeats surveys on randomly selected stream segments. The data system also includes methods for checking the data's internal consistency.

Monitoring/assessment of program

Institutional analysis:

Most successful aspects The collection of basic data regarding aquatic habitat and fish distribution in a standardized and accessible format is of great benefit to agency biologists.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

The Research and Development Section will be expanding efforts to develop ways to integrate Aquatic Inventory Project data with other field data to facilitate basin-wide and watershed-wide assessment. This broader focus will enhance a number of watershed-focused restoration and protection efforts, including the state's Watershed Health Initiative and the federal government's protection efforts in watersheds targeted by the Forest Ecosystem Management Assessment Team (FEMAT).

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Blue Mountains Natural Resources Institute
Agency	U.S. Forest Service
Contact Person, Address, Phone	James D. McIver Learning Center Director Blue Mountains Natural Resources Institute 10901 Island Avenue La Grande, OR 97850 (503) 962-6590
Watershed Management Program Element	Primary element: 4 - Education Additional element: 5 - Demonstration projects
EPA Management Measures	F1 - F10 (all Forestry Management Measures) A6 - Grazing Management Measure
Program Authorities (laws, ordinances)	No specific statutory mandate.
Program Description/ Objectives	<p>The mission of the Blue Mountains Natural Resource Institute is to enhance the long-term economic and social benefits derived from the area's natural resources in an ecologically sound and sustainable manner. The Institute has five primary elements: research, development, application, demonstration, and education.</p> <p>The Elk Creek Demonstration Area in the Wallowa-Whitman National Forest displays the effects of riparian restoration management activities since 1986, including stream exclosures, time-restricted riparian use by cattle, and the rebuilding of stream structure using rocks and large woody debris.</p> <p>The Institute's stated objectives are as follows:</p> <ul style="list-style-type: none">• Compile basic biological and ecological information needed to improve forest and rangeland health and vigor.• Develop technology to guide intensive multi-resource management and policy for sustaining long-term productivity and ecological values in the early decades of the 21st century.• Develop new technology that will enable forest and range managers to emphasize multi-resource benefits, reduce the hazards of fire and insect and disease outbreaks, and

- accommodate potential climate change.
- Develop long- and short-term forest management practices for use by land management agencies and landowners in concert with public values.
- Rapidly convert results of research into applicable technology.
- Establish mutually beneficial relations with individuals and groups to inform them of new research, development, and management direction, and to obtain response and advice from them.
- Stimulate cooperative research and development among universities and other federal and state agencies.
- Enhance the long-term economic and social benefits derived from the region's forest- and rangeland-associated resources in cooperation with county and regional economic strategies.
- Demonstrate the application of technology and resource knowledge.
- Focus research on management for production of multiple resource benefits such as water, fish, grazing, wildlife, timber, and recreation.
- Provide an unbiased forum for open and objective debate, discussion, and consensus on policy and management issues.

Geographic Scope

The Blue Mountains area of northeast Oregon and southeast Washington. This includes all or parts of basins 25, Deschutes; 26, John Day; 27, Umatilla; 28, Walla Walla; 31, Grande Ronde; 32, Powder; 33, Malheur River; 41, Malheur Lake.

**Public Assistance
Components:**

Not applicable.

Type
Number
Eligibility criteria

**Public Education
Components:**

Written/video

Natural Resource News (quarterly); video lending library; brochures

Target audience

Resource managers and the active and informed public.

Number distributed

3,400 copies of each edition of the newsletter.

Method of distribution

Newsletters mailed to mailing list.

Scheduled/planned

Ongoing.

Seminars, workshops

Numerous.

Target audience

Resource managers and the active and informed public.

Dates and attendance	Blue Mountains Biodiversity Conference, May, 1992. Ecosystem management seminar series, spring, 1993, 450 people. Fire ecology seminar series, fall, 1993, 350 people.
Scheduled/planned	Seminar series on water resources planned for spring, 1994. Workshop, "Managing Landscapes and Ecosystems: A Practical Approach," scheduled for April 26-28, 1994, in John Day, co-sponsored by U.S. Forest Service, Bureau of Land Management, Boise Cascade Corporation, the Nature Conservancy, and OSU Extension Service.
Funding:	
Amount	\$1.5 million for all Institute activities; 13-14% for Learning Center.
Source	U.S. Forest Service is the primary funding source. The U.S. Environmental Protection Agency and the Bureau of Land Management also provide funds.
Timing	Annual.
Coordination with other agencies	The Institute has 80 partners, including federal and state natural resource agencies, county and tribal governments, educational institutions, natural resource industries, business, labor and environmental groups. A major purpose of the organization is to facilitate cooperation and conflict resolution and encourage new partnerships.
Program effectiveness:	
Standards applied	
Monitoring/assessment of program	The organization is in the process of developing a plan for measuring the effectiveness of its education program. Evaluation forms are used to elicit audience feedback on the seminar series.
Institutional analysis:	
Most successful aspects	Bringing people together in a variety of formats has been one of the most successful aspects of the program.
Problems experienced, e.g.:	In some instances, groups or agencies have pursued their own agendas, although in general, the partners have worked well together.
Unclear goals, responsibilities or procedures	
Conflicting efforts by other programs	
Difficulties coordinating with other programs	
Insufficient resources, funding	
Duplication of effort	
Possible improvements to effectiveness:	

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Boating Safety Education Program
Agency	Oregon State Marine Board
Contact Person, Address, Phone	Marty Law Oregon State Marine Board 435 Commercial Street NE Salem, OR 97310 (503) 373-1405 x241
Watershed Management Program Element	4 - Education
EPA Management Measures	M13 - Public Education Management Measure
Program Authorities (laws, ordinances)	
Program Description/ Objectives	The Boating Safety Education Program produces and distributes numerous pamphlets and brochures, including the Oregon Boater's Handbook and the Oregon Boating Facilities Guide. Safety is the primary focus of the education program, but information is included on marine toilet regulations, littering and plastics pollution, and oil discharge. The Oregon Boater's Handbook includes a summary of marine toilet regulations and lists holding tank pumpout station locations. The program also distributes educational material from the U.S. Coast Guard and the Red Cross relating to boating safety, and maintains a library of films, videos, and slide shows on boating safety.
Geographic Scope	Statewide.
Public Assistance Components: Type Number Eligibility criteria	Not applicable.
Public Education Components: Written/video Target audience Number distributed	Boaters.

Method of distribution

Scheduled/planned

A brochure focused on the environmental impacts of boating will likely be developed sometime during 1994.

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

Source

Timing

**Coordination with
other agencies**

The Marine Board works with the Red Cross, Coast Guard, and other agencies in the distribution of educational material.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Boating Facility Grants Program
Agency	Oregon State Marine Board
Contact Person, Address, Phone	Dave Obern, Manager Boating Facilities Program Oregon State Marine Board 435 Commercial St. NE Salem, OR 97310 (503) 373-1405
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	M7 - Sewage Facility Management Measure M14 - Maintenance of Sewage Facilities Management Measure
Program Authorities (laws, ordinances)	ORS 830.150; OAR 250-14-001 to 250-14-003.
Program Description/ Objectives	<p>The Marine Board uses revenues from boater title and registration fees and marine fuel taxes to provide matching funds to state and federal agencies, cities, counties, Park and Recreation Districts, Port Districts, and other public bodies to improve boating facilities in the state, many of which are old and in need of repair. Many of the boating facilities built or improved through this program do not assist in nonpoint source pollution control, e.g., launch ramps, parking, moorages, and access roads. However, program funds can be used for restrooms, floating restrooms, and pumpout stations, which will aid in nonpoint source pollution control. State law (ORS 830.150(2)(a) requires the Marine Board to give first priority to applications for facilities designed to control water pollution or otherwise enhance water quality, and to those other facilities for which there appears the greatest public need. With the advent of a federal grant program specifically for pumpout facilities and dump stations (see Clean Vessel Act program), additional projects will be funded which will aid in nonpoint source control.</p>
Geographic Scope	Statewide

Public Assistance**Components:****Type****Number**

Cost-share payments, 10 - 50% matching funds required.

70% of available funds in a biennium are distributed the first July of the biennium. In July, 1993, the Marine Board approved 52 grants totalling \$2.78 million. Next April an additional 20% of the funds will be distributed in Round 2. The last 10% is retained for emergencies, and will be distributed, if still available, in April, 1995. Funds must be expended by June 30, 1995.

Eligibility criteria

Applicant must be a public entity. Eligible projects include launch ramps, boarding floats, transient docks, access roads, parking areas, restrooms, utilities, sewage pumpout stations, dredging, signage, and floating restrooms. Entities receiving funds must enter into a 20-year agreement with the Marine Board accepting responsibility for maintenance of the facility and agreeing not to sell the facility.

Public Education**Components:****Written/video****Target audience****Number distributed****Method of distribution****Scheduled/planned****Seminars, workshops****Target audience****Dates and attendance****Scheduled/planned**

Not applicable.

Funding:**Amount****Source****Timing**

\$4.4 million for 1993-95 biennium.

State boater title and registration fees; marine fuel tax receipts.

Biennial.

**Coordination with
other agencies**

The Board coordinates with the Oregon Division of State Lands and the Army Corps of Engineers on permit applications for facilities.

Program effectiveness:**Standards applied****Monitoring/assessment of program****Institutional analysis:**

Most successful aspects

Marine Board staff believes that the boating community, which finances this program through fees and taxes, supports the program and the Marine Board's administration of it.

Problems experienced, e.g.:

- Unclear goals, responsibilities or procedures
- Conflicting efforts by other programs
- Difficulties coordinating with other programs
- Insufficient resources, funding
- Duplication of effort

Possible improvements to effectiveness:

- Acceleration or expansion of current activities
- New efforts needed
- New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Boating Facility Maintenance Assistance Program
Agency	Oregon State Marine Board
Contact Person, Address, Phone	Dave Obern, Manager Boating Facilities Program Oregon State Marine Board 435 Commercial Street NE Salem, OR 97310 (503) 373-1405 x252
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	M14 - Maintenance of Sewage Facilities Management Measure
Program Authorities (laws, ordinances)	ORS 830.150(2)(A), OAR 250-14-004.
Program Description/ Objectives	The Maintenance Assistance Program provides funds to cities, counties, park and recreation districts, port districts, and state parks for routine and ordinary maintenance of boating facilities. The program is voluntary, and its purpose is to improve the quality of maintenance provided at public boating facilities. While much of the maintenance is for facilities such as boat ramps, docks, and parking areas, the funds may also be used for restroom maintenance and garbage and litter pickup, which will aid in nonpoint source pollution control.
Geographic Scope	Statewide.
Public Assistance Components:	
Type	Grants.
Number	
Eligibility criteria	The boating facility must be an "improved marine facility," which includes designated public launch ramps with a hard surface, parking area (for at least 10 boat trailers), and sanitary facilities (may be seasonal). Also included are designated public transient moorages 200 feet or longer in length and developed marine parks only accessible by boat.

Public Education Not applicable.

Components:

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

\$1.8 million for 1993-95 biennium.

Source

Oregon legislative appropriation.

Timing

Biennial.

**Coordination with
other agencies**

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Citizen Lake Watch
Agency	Oregon Department of Environmental Quality; Portland State University
Contact Person, Address, Phone	Dr. Richard Petersen Department of Biology Portland State University PO Box 751 Portland, OR 97207-0751 (503) 725-4241
Watershed Management Program Element	Primary element: 2 - Assessment Additional elements: 4 - Education 6 - Technical assistance 8 - Stewardship
EPA Management Measures	All
Program Authorities (laws, ordinances)	Clean Water Act Section 314(b).
Program Description/ Objectives	The Citizen Lake Watch Program recruits and trains volunteers to monitor Oregon lakes on a regular basis. Volunteers go by boat to a lake's deepest point and determine Secchi disk depth (a measure of transparency), pH, air and water temperatures, and dissolved oxygen, and collect samples of aquatic plants and surface phytoplankton growth. In 1993, 36 volunteers took weekly or biweekly samples from 27 lakes in the state, 12 in the Coast ecoregion. Sampling data are returned to the program's coordinator for entry into a database. In addition to training and supplies, volunteers receive the program's quarterly newsletter containing monitoring results. The program is being expanded to include technical assistance to lakeshore homeowners as well as additional program development.
Geographic Scope	Currently lakes are monitored in basins 11 - North Coast; 12 - Mid-Coast; 14 - South Coast; 22 - Willamette; 23, Sandy; 25 - Deschutes; and 31 - Grande Ronde.
Public Assistance Components: Type	Not applicable.

Number
Eligibility criteria

Public Education

Components:

Written/video	The Lake Watcher, a quarterly newsletter about the Citizen Lake Watch Program
Target audience	Current and prospective volunteers and interested public.
Number distributed	
Method of distribution	Mail.
Scheduled/planned	
Seminars, workshops	Training seminars are held periodically for volunteers.
Target audience	Volunteers and prospective volunteers.
Dates and attendance	
Scheduled/planned	

Funding:

Amount	\$30,000 for FY-94; \$50,000 for FY-95.
Source	EPA Lake Water Quality Assessment Grant; appropriations, U.S. Congress.
Timing	Annual.

**Coordination with
other agencies**

There is some coordination with the U.S. Forest Service, which manages the land on which many of the Cascade ecoregion lakes are located. Networks with other state agencies involved in lake and watershed management are being established.

Program effectiveness:

Standards applied	EPA data standards are applied to lake water quality data.
Monitoring/assessment of program	Limited quality assurance sampling is conducted.

Institutional analysis:

Most successful aspects	The data gathered by volunteers represents a large body of information about Oregon's lakes that otherwise would not be available. In addition, the network of volunteers is an effective avenue for disbursing information about lakes and trends in the data.
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Problems experienced, e.g.:

- Unclear goals, responsibilities or procedures**
- Conflicting efforts by other programs**
- Difficulties coordinating with other programs**
- Insufficient resources, funding**

In the past, the program has had a part-time coordinator who was a student at Portland State University. Additional funds from EPA for FY-95 will be used to provide for a full-time

program developer, which is critical if the program is to expand.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

Recruitment of more volunteers could increase the number of lakes monitored through the program.

New efforts needed

An advisory committee would be helpful in setting policy and direction for the program. It would also be helpful to include other state agencies in program operations, in particular the Oregon Department of Fish and Wildlife and the Parks and Recreation Department. The full-time program developer will also develop and distribute information and outreach materials and provide technical assistance to lake homeowners and interested groups.

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Clean Vessel Act Grant Program
Agency	Oregon State Marine Board
Contact Person, Address, Phone	Valerie Hoy Oregon State Marine Board 435 Commercial Street NE Salem, OR 97310 (503) 373-1405 x234
Watershed Management Program Element	Primary element: 7 - Cost-share assistance Additional element: 4 - Education
EPA Management Measures	M7 - Sewage Facility Management Measure M13 - Public Education Management Measure M14 - Maintenance of Sewage Facilities Management Measure
Program Authorities (laws, ordinances)	Clean Vessel Act, Public Law 102-587, Subtitle F.
Program Description/ Objectives	The Oregon State Marine Board recently received notification that its application for federal Clean Vessel Act funds has been granted. These funds will enable the state to establish a statewide program providing grants to public and private boating facilities for construction, renovation, operation and maintenance of pumpout and dump stations and costs associated with storage and transport to sewage treatment plants. (Pumpouts extract sewage from boat holding tanks while dump stations are used to empty portable toilets.) The program also has a planning component, which will survey existing facilities, and a public education component, which will target recreational boaters and inform them about pollution problems resulting from sewage discharges from vessels and inform them of the location of pumpout and dump stations.
Geographic Scope	Statewide.
Public Assistance Components:	
Type	Grants
Number	
Eligibility criteria	

Public Education Components:	Public education will be a component of the program, but the program is still in the planning phase.
Written/video	
Target audience	Recreational boaters
Number distributed	
Method of distribution	
Scheduled/planned	
Seminars, workshops	
Target audience	
Dates and attendance	
Scheduled/planned	
Funding:	
Amount	\$698,875 in Clean Vessel Act funds for FY-93 and FY-94.
Source	U.S. Clean Vessel Act.
Timing	Annual.
Coordination with other agencies	The U.S. Fish and Wildlife Service administers the program of grants to states.
Program effectiveness:	As the program is still being developed, it is too early to assess its effectiveness. However, as there are only 18 pumpouts and dump stations at present in the entire state, the construction of new facilities which these grants will support will create
Standards applied	
Monitoring/assessment of program	
Institutional analysis:	
Most successful aspects	
Problems experienced, e.g.:	
Unclear goals, responsibilities or procedures	
Conflicting efforts by other programs	
Difficulties coordinating with other programs	
Insufficient resources, funding	
Duplication of effort	
Possible improvements to effectiveness:	
Acceleration or expansion of current activities	
New efforts needed	
New authority	

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Coastal Oregon Productivity Enhancement Program (COPE)
Agency	Cooperative effort: Oregon State University; U.S. Forest Service, Pacific Northwest Research Station; U.S. Bureau of Land Management; other federal and state agencies; forest industry; county and city governments; and Oregon Small Woodland Association.
Contact Person, Address, Phone	Stephen Hobbs COPE Program Manager Forestry Sciences Laboratory 3200 SW Jefferson Way Corvallis, OR 97331 (503) 750-7426
Watershed Management Program Element	Primary element: 4 - Education Additional elements: 5 - Demonstration projects 6 - Technical assistance
EPA Management Measures	F1 - Preharvest Planning F2 - Streamside Management Areas (SMAs) F3 - Road Construction/Reconstruction F4 - Road Management F5 - Timber Harvesting F6 - Site Preparation and Forest Regeneration F7 - Fire Management F8 - Revegetation of Disturbed Areas F9 - Forest Chemical Management F10 - Wetlands Forest W1 - Protection of Wetlands and Riparian Areas W2 - Restoration of Wetlands and Riparian Areas
Program Authorities (laws, ordinances)	No specific statutory authority.
Program Description/ Objectives	COPE is a 12-year cooperative research and education program that began in 1987 involving Oregon State University, many federal and state agencies, local government, and the forest industry. The program's intent is to provide resource managers and the public with information relative to the issues and opportunities associated with the management of the natural resources of the Oregon Coast Range, including fish, timber, water and wildlife. The program consists of two components. Fundamental COPE is a basic research effort addressing

problems related to riparian zone management and reforestation. Major participants in this component are Oregon State University's College of Forestry and the Pacific Northwest Research Station of the U.S. Forest Service. Adaptive COPE, stationed in Newport at the Hatfield Marine Science Center, is an interdisciplinary team responsible for applying and adapting new and existing research information to solve specific management problems. Adaptive COPE also provides continuing education opportunities such as workshops, symposia, and field trips. Both components of COPE are involved in technology transfer through publication of research results in technical and scientific journals. COPE has a long-range plan setting out research tasks relating to the management issues of riparian zone management and reforestation in the Oregon Coast Range.

Geographic Scope

Oregon Coast Range: Basins 11 - North Coast-Lower Columbia; 12 - Mid-Coast; 13 - Umpqua; 14 - South Coast; 15 - Rogue.

Public Assistance

Not applicable.

Components:

Type

Number

Eligibility criteria

Public Education

Components:

Written/video

COPE Report, a quarterly newsletter.

Target audience

Resource managers and the public.

Number distributed

Approximately 2,000.

Method of distribution

Mail.

Scheduled/planned

Seminars, workshops

Numerous. Most recent was on slope stability.

Target audience

Resource management professionals.

Dates and attendance

140.

Scheduled/planned

Funding:

Amount

Total budget is \$2.6 million, of which approximately \$270,000 goes toward education and technology transfer. The rest supports research.

Source

\$1.3 million from BLM; remainder from the other 34 cooperating agencies.

Timing

Annual.

**Coordination with
other agencies**

COPE itself is a coordinated effort involving federal, state, county and city governments, the forest products industry, Oregon State University, and the Oregon Small Woodland Association.

Program effectiveness:

Standards applied

Monitoring/assessment of program

The program conducts an annual evaluation of progress toward achieving specific research tasks identified in the COPE Long-Range Plan.

Institutional analysis:

Most successful aspects

COPE has been successful in getting diverse groups to work together toward common objectives. Significant research progress has been made in fish and wildlife habitat-related issues, active riparian zone management, slope stability, integrated forest operations, and reforestation.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Conservation Reserve Program
Agency	Agricultural Stabilization and Conservation Service
Contact Person, Address, Phone	Elizabeth (Betty) L. Lissman State Program Specialist Oregon State ASCS Office 7620 SW Mohawk, PO Box 1300 Tualatin, OR 97062 (503) 692-6830 x228
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	A-1 - Erosion and Sediment Control Management Measure
Program Authorities (laws, ordinances)	Food Security Act of 1985, Title XII, subtitles A through E, sections 1201 - 1245.
Program Description/ Objectives	This program encourages farmers, through 10-year contracts with USDA, to stop growing crops on highly erodible cropland and plant it to a protective cover of grass or trees.
Geographic Scope	Statewide.
Public Assistance Components:	
Type	Cost-share payments for conversion to permanent vegetative cover; rental payments for land converted.
Number	20,033 acres were treated with cost-shared practices in year ending 9/30/93.
Eligibility criteria	Only highly erodible croplands are eligible for inclusion in the program. The landowner must implement a conservation plan during the 10 years of the contract. ASCS is not accepting new applications for the CRP at this time due to Congressional funding limitations. Farmers with acreage enrolled in the program may still receive cost-share payments related to the establishment of permanent vegetative cover. Further, the annual lease payments continue for the duration of the 10-year contracts.

Public Education

Components: Not applicable.

Written/video**Target audience****Number distributed****Method of distribution****Scheduled/planned****Seminars, workshops****Target audience****Dates and attendance****Scheduled/planned****Funding:****Amount**

\$349,456 cost-share for period 10/01/92 - 9/30/93.

528,409.8 acres in Oregon are enrolled in the program, receiving an average lease payment of \$45 per acre, for a total of \$23,778,441 annually in lease payments to Oregon farmers.

Source

Appropriations, U.S. Congress

Timing

Federal fiscal year, 10/1 - 9/30.

**Coordination with
other agencies**

The Soil Conservation Service provides technical assistance in developing the required conservation plan. The Extension Service, ODF, and local Soil and Water Conservation Districts are also involved.

Program effectiveness:**Standards applied****Monitoring/assessment of program****Institutional analysis:****Most successful aspects****Problems experienced, e.g.:****Unclear goals, responsibilities or procedures****Conflicting efforts by other programs****Difficulties coordinating with other programs****Insufficient resources, funding****Duplication of effort****Possible improvements to effectiveness:****Acceleration or expansion of current activities****New efforts needed****New authority**

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Container Nursery Irrigation Water Management Program
Agency	Oregon Department of Agriculture
Contact Person, Address, Phone	Michael J. Wolf Project Coordinator Natural Resources Division Oregon Department of Agriculture 635 Capitol Street NE Salem, OR 97310-0110 (503) 378-3810
Watershed Management Program Element	8 - Stewardship
EPA Management Measures	A7 - Irrigation Water Management Measure
Program Authorities (laws, ordinances)	No specific statutory mandate.
Program Description/ Objectives	The container nursery irrigation water management program is a voluntary effort by the container nursery industry to eliminate irrigation water discharge and thus avoid future regulation of the industry. A written agreement between the nursery industry, the Department of Agriculture, and the Department of Environmental Quality sets out the terms of the program. Under the program, ODA contacted all operators of container nurseries, who are required to register under the program. Irrigation water is recycled and no discharges are allowed. ODA monitors nurseries larger than five acres in targeted watersheds, at present the Bear Creek and Tualatin basins.
Geographic Scope	Statewide
Public Assistance Components: Type (grant/loan) Number Eligibility criteria	Not applicable.
Public Education Components:	Not applicable.

Written/video**Target audience****Number distributed****Method of distribution****Scheduled/planned****Seminars, workshops****Target audience****Dates and attendance****Scheduled/planned****Funding:****Amount**

Not separately funded.

Source

ODA general funds.

Timing

Biennial state appropriations.

**Coordination with
other agencies**ODA worked with DEQ and the container nursery industry
to establish this voluntary program.**Program effectiveness:****Standards applied**Under the program, no discharges of irrigation water during the
irrigation season were permitted after June 1, 1993, unless the
facility obtained a Water Pollution Control Facility permit before
that date. No facilities applied for the permit, and thus no
discharges are permitted.**Monitoring/assessment of program**Larger nurseries in selected watersheds have been targeted for
compliance verification.**Institutional analysis:****Most successful aspects** All container nurseries agreed to completely eliminate irrigation
water discharge, thus removing one source of nonpoint source
pollution while obviating the need for state regulation.**Problems experienced, e.g.:****Unclear goals, responsibilities or procedures****Conflicting efforts by other programs****Difficulties coordinating with other programs****Insufficient resources, funding****Duplication of effort****Possible improvements to effectiveness:****Acceleration or expansion of current activities****New efforts needed****New authority**

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Emergency Conservation Program
Agency	Agricultural Stabilization and Conservation Service
Contact Person, Address, Phone	Elizabeth (Betty) L. Lissman State Program Specialist Oregon State ASCS Office 7620 SW Mohawk, PO Box 1300 Tualatin, OR 97062 (503) 692-6830 x228
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	A1 - Erosion and Sediment Control Management Measure A6 - Grazing Management Measure A7 - Irrigation Water Management Measure
Program Authorities (laws, ordinances)	Agricultural Credit Act of 1978, Title IV, 16 U.S.C. 2201, as amended by Disaster Assistance Act of 1989, Section 502.
Program Description/ Objectives	ECP provides emergency funds for sharing with farmers and ranchers the cost of rehabilitating farmland damaged by wind erosion, floods, hurricanes, or other natural disasters, and for carrying out emergency water conservation measures during periods of severe drought.
Geographic Scope	Statewide.
Public Assistance Components:	
Type	Cost-share assistance up to 64%.
Number	89,579 acres were treated through ECP in the year ending 9/30/93.
Eligibility criteria	Eligibility for ECP assistance is determined by county committees on an individual basis, taking into account the type and extent of damage. County committees can approve individual or cumulative requests for cost-sharing of up to \$10,000 per person, and the state Agricultural and Stabilization Committee can authorize cost-sharing of up to \$20,000 per person. Requests for cost-sharing above \$20,000 per person must be approved by a Deputy Administrator of ASCS.
	Emergency practices may include debris removal, provision of

water for livestock, fence restoration, grading and shaping of farmland, restoring structures, water conservation measures, and other measures authorized by county committees and approved by ASCS.

Damage to farmland caused by wind erosion, floods, hurricanes, or other natural disasters can be rehabilitated through ECP. Damage from drought is not normally covered, but can be approved by an ASCS Deputy Administrator when severe drought conditions exist.

The natural disaster must create new conservation problems which, if not treated, would:

- Impair or endanger the land;
- Materially affect the productive capacity of the land;
- Represent unusual damage which (except for wind erosion) is not the type likely to recur frequently in the same area; and
- Be so costly to repair that federal assistance is required to return the land to productive agricultural use.

Public Education

Components: Not applicable.

Written/video (attach copy)

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

\$175,402 for period 10/1/92 - 9/30/93 (down from \$363,212 for previous 12-month period).

Source

Appropriations, U.S. Congress.

Timing

Annual.

**Coordination with
other agencies**

Technical assistance is provided by the U.S. Soil Conservation Service.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Fish Restoration and Enhancement Program
Agency	Oregon Department of Fish and Wildlife
Contact Person, Address, Phone	Pat Oman, Program Coordinator Fish Restoration and Enhancement Program Oregon Department of Fish and Wildlife PO Box 59 Portland, OR 97207 (503) 229-5410 x361
Watershed Management Program Element	5 - Demonstration projects
EPA Management Measures	A1 - Erosion and Sediment Control Management Measure A6 - Grazing Management Measure W2 - MM for Restoration of Wetlands and Riparian Areas
Program Authorities (laws, ordinances)	Oregon Fisheries Restoration and Enhancement Act of 1989; Oregon Laws 1989, chapter 512.
Program Description/ Objectives	<p>The Restoration and Enhancement Program targets fish habitat, and funds projects which restore this function. The program is funded by a surcharge on fishing licenses and by commercial fishing permit fees. Half the funds are used for improvements to fish hatcheries; the other half is used for fisheries enhancement including habitat restoration projects. A seven-member Restoration and Enhancement Board appointed by the state Fish and Wildlife Commission selects proposals for funding.</p> <p>Representative projects which improve water quality include restoration of instream and riparian habitat, planting of riparian areas, and fencing of riparian areas to exclude livestock.</p> <p>Applicants may be public or private non-profit organizations, including governments. ODFW and federal land management agencies receive many of the Restoration and Enhancement grants.</p>
Geographic Scope	Statewide.
Public Assistance Components:	

Type	Grants.
Number	No specific limit; 62 restoration and enhancement projects were funded in the 1991-93 biennium.
Eligibility criteria	No specific limit on grant amounts. Largest was \$200,750; smallest, \$2,254; average, \$25,095. Projects must benefit the sport or commercial fisheries. Any public or private non-profit organization may apply. Projects will be evaluated for their contribution to the recreational and/or commercial fisheries. Projects which have matching funds or which will be implemented by volunteers or non-profit organizations are given special consideration. Projects must be consistent with fish management plans as well as local land use plans, and must be biologically sound.
Public Education Components:	Not applicable.
Written/video	
Target audience	
Number distributed	
Method of distribution	
Scheduled/planned	
Seminars, workshops	
Target audience	
Dates and attendance	
Scheduled/planned	
Funding:	
Amount	More than \$2 million/year for both restoration and enhancement for 1991-93 biennium. \$1,775,930 allocated to enhancement projects during 1991-93 biennium, including \$200,000 for physical and biological surveys of streams. The balance was allocated to restoration of the state's hatchery system.
Source	Surcharge on state sport fishing licenses, commercial salmon fishing licenses and poundage fees. Lottery revenues prior to 1993-95 biennium.
Timing	State appropriations are biennial.
Coordination with other agencies	The U.S. Forest Service, the U.S. Fish and Wildlife Service, the Bureau of Land Management, the Oregon Department of Forestry, and many local governments have participated in enhancement projects funded by this program.
Program effectiveness:	
Standards applied	
Monitoring/assessment of program	
Institutional analysis:	

Most successful aspects The program mobilized more than \$4 million in matching funds for enhancement projects during the 1991-93 biennium.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

In past biennia, the program was augmented by lottery revenues: \$1.3 million in 1989-91, and \$500,000 in 1991-93. The lack of any such funding in 1993-95 has limited the amount of habitat improvement work that can be done.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Forestry Incentives Program
Agency	Agricultural Stabilization and Conservation Service
Contact Person, Address, Phone	Elizabeth (Betty) L. Lissman State Program Specialist Oregon State ASCS Office 7620 SW Mohawk, PO Box 1300 Tualatin, OR 97062 (503) 692-6830 x228
Watershed Management Program Element	Primary element: 7 - Cost-share Assistance Additional element: 6 - Technical Assistance
EPA Management Measures	F6 - Site Preparation and Forest Regeneration
Program Authorities (laws, ordinances)	Cooperative Forestry Assistance Act of 1978, 16 U.S.C 2103, Section 4.
Program Description/ Objectives	The Forestry Incentives Program (FIP) aims to increase the nation's supply of timber products from private non-industrial forest lands. The program provides cost-share payments to encourage landowners to plant trees on suitable open lands or cutover areas, and to perform timber stand improvement work for production of timber and other related forest resources. The program is jointly administered by the ASCS and the U.S. Forest Service. Congress appropriates funds to ASCS, which issues the cost-share payments to qualified landowners. Funds for technical assistance are transferred to the Forest Service, which then passes the funding along to the Oregon Department of Forestry, which actually provides the technical assistance through its Service Forestry program.
Geographic Scope	Statewide. Most activity is located in the northwest region of the state, especially Columbia County.
Public Assistance Components:	
Type	Cost-share payments are limited to 65% of the average cost of specified activities. For planting trees, cost-sharing is available for the cost of site preparation (including erosion control measures), moisture conserving measures, seedlings and transplant stock of specified species, and for planting. For

	improving a stand of forest trees, cost-sharing is available for precommercial thinning, slash disposal, and for release of desirable seedlings and young trees.
Number	There is no maximum number of cost-share participants. In the year ending 9/30/92, about 115 landowners received FIP cost-share payments.
Eligibility criteria	Landowner must develop a forest management plan in cooperation with ODF, which must consider wildlife protection and enhancement, watershed protection, erosion control, and other forest resource values in addition to cost-effective timber production. Landowner must enter into agreement with Secretary of Agriculture. In Oregon, the agreements are for a period of one year, but the landowner must agree to maintain the practice for 10 years. Water quality must be maintained both during and after site preparation.
	Parcels must be a minimum of 10 acres, and high priority is given to parcels of 40 acres or more.
Public Education	
Components:	Not applicable.
Written/video	
Target audience	
Number distributed	
Method of distribution	
Scheduled/planned	
Seminars, workshops	
Target audience	
Dates and attendance	
Scheduled/planned	
Funding:	
Amount	\$454,505 for period 10/1/92 - 9/30/93.
Source	Appropriations, U.S. Congress.
Timing	Annual.
Coordination with other agencies	FIP is jointly administered by the U.S. Forest Service. The Oregon Department of Forestry provides technical assistance.
Program effectiveness:	
Standards applied	
Monitoring/assessment of program	On a national level, the Forest Service and ASCS are required to report to Congress on the effectiveness of the FIP, including cost-effectiveness. On the state and local level, county Conservation Review Groups submit recommendations regarding

all ASCS programs, which are reviewed annually by a state Conservation Review Group.

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Funding is not available for long-term contracts, which are desirable for two reasons: farmers are more attracted to long-term contracts with the money paid in the initial year; and long-term contracts ensure that the management practices put into place will continue for the duration of the contract period.

The state's FIP allocation is typically exhausted in 3-4 months.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Integrated McKenzie Watershed Management Program
Agency	Lane Council of Governments (LCOG)
Contact Person, Address, Phone	Kathi Wiederhold Project Manager Lane Council of Governments Local Government Services Division 125 E. Eighth Avenue Eugene, OR 97401 (503) 687-4430
Watershed Management Program Element	3 - Coordinated watershed planning
EPA Management Measures	All
Program Authorities (laws, ordinances)	Clean Water Act; Food Security Act.
Program Description/ Objectives	<p>The Integrated McKenzie Watershed Management Program focuses on a 1,300 square mile area which is the source of drinking water for more than 200,000 Lane County residents. The program is directed by an 18-member McKenzie Watershed Council, consisting of 13 representatives from local agencies and watershed interests, and two state and three federal representatives. Project management and staff assistance is provided by the Lane Council of Governments (LCOG).</p> <p>The Watershed Council has been meeting regularly since its formation in June, 1993. The Council's purpose is to provide a framework for coordination and cooperation of key interests, so those interests can deal in a comprehensive manner with watershed issues. A primary objective is to develop processes for coordination that will remain in place on a permanent basis.</p> <p>The program has already developed a basin-wide geographic information system with base data layers including land use, zoning, water features, and soils.</p> <p>The Council is presently developing a watershed work program and a citizen involvement program. The work program will help to integrate various plans and programs of state, federal</p>

	and local agencies within the watershed.
	The work program will provide strategies for development of a number of products including an ongoing decision-making mechanism, coordination of existing plans and programs, public information and involvement, a comprehensive geographic information system for the entire watershed and an action plan.
Geographic Scope	McKenzie River Watershed (part of basin 22 - Willamette).
Public Assistance Components:	Not applicable.
Type	
Number	
Eligibility criteria	
Public Education	Development of a citizen involvement program is one of the Council's major activities at this time, and public education is an important aspect of the program.
Components:	
Written/video	Information packets have been developed, as well as a slide show and display panels.
Target audience	Interested groups.
Number distributed	
Method of distribution	Mail.
Scheduled/planned	
Seminars, workshops	A speaker's network has been formed as the first phase of a citizen involvement campaign. Teams of Council partners are meeting with key groups for the purpose of sharing information and establishing a dialogue with key groups to learn their issues and areas of concern.
Target audience	Watershed stakeholders and the interested public.
Dates and attendance	Team meetings with key groups are scheduled for February and March, 1994.
Scheduled/planned	A forum is planned for late April to involve the general public.
Funding:	
Amount	\$600,000 from EPA; \$250,000 from SCS.
Source	Appropriations, U.S. Congress.
Timing	SCS funding is for 2-3 years; EPA funding is for 2-3 years.
Coordination with other agencies	Coordination among federal, state and local agencies is one of the major purposes of the program. A McKenzie Coordination Team, consisting of staff from the Bureau of Land Management, U.S. Forest Service, U.S. Soil Conservation Service, Oregon Water Resources Department, Eugene Water and Electric

Board, Lane County, Lane Council of Governments, and the University of Oregon, provides ongoing coordination and technical support.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Monitoring of watershed conditions is likely to be a component of the watershed plan which is presently being developed.

Institutional analysis:

Most successful aspects

Recruiting diverse watershed stakeholders for the Watershed Council and building a consensus as to the program's major goals and priorities has been a lengthy, but successful, process. The establishment of the ArcInfo-based geographic information system covering the entire watershed, and the development of eight base data layers is a significant accomplishment. Coordination with the Bureau of Land Management and U.S. Forest Service will help the public to better understand government activities in the watershed.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Lower Columbia River Bi-State Water Quality Study
Agency	Oregon Department of Environmental Quality, Washington Department of Ecology
Contact Person, Address, Phone	Don Yon Oregon Department of Environmental Quality 811 SW Sixth Avenue Portland, OR 97204 (503) 229-5995
Watershed Management Program Element	2 - Assessment
EPA Management Measures	All
Program Authorities (laws, ordinances)	Interstate Agreement between Oregon and Washington
Program Description/ Objectives	The Lower Columbia River Bi-State Water Quality Study Program was established to characterize water quality in the Lower Columbia River basin, identify water quality problems, determine whether beneficial uses are impaired, and develop solutions. The study was initiated in early 1990, and was originally planned as a four-year project ending in March, 1995. The program has been extended to June, 1995.
Geographic Scope	Lower Columbia River (from Bonneville Dam to the mouth of the river, a distance of 146 miles).
Public Assistance Components: Type (grant/loan) Number Eligibility criteria	Not applicable.
Public Education Components: Written/video (attach copy) Target audience Number distributed Method of distribution Scheduled/planned	A public involvement/education program is planned.

Seminars, workshops	Workshops will be included in the program.
Target audience	General public; stakeholders.
Dates and attendance	
Scheduled/planned	\$50,000 is budgeted for public involvement and education.

Funding:

Amount	\$2.89 million over life of study
Source	One-third each from the Oregon and Washington legislatures and a consortium of pulp and paper companies and public ports
Timing	

Coordination with other agencies	Oregon Department of Environmental Quality and Washington Department of Ecology are the lead agencies.
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Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

There was a problem with the Steering Committee exceeding its advisory role and attempting to direct staff effort. This has been addressed and appears to be resolved.

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

When the current phase ends, there will be a need for extensive follow-up.

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Model Watershed Program
Agency	Northwest Power Planning Council
Contact Person, Address, Phone	John L. Marsh System Planning Coordinator Fish and Wildlife Division Northwest Power Planning Council 851 SW Sixth Avenue, Suite 1100 Portland, OR 97204-348 (503) 222-5161
Watershed Management Program Element	Primary element: 9 - Watershed enhancement projects Additional elements: 2 - Assessment 3 - Coordinated watershed planning
EPA Management Measures	All
Program Authorities (laws, ordinances)	Pacific Northwest Electric Power Planning and Conservation Act of 1980, Public Law 96-501.
Program Description/ Objectives	<p>The Model Watershed Program is one component of the NWPPC's Columbia River Basin Fish and Wildlife Program. There is one project in Oregon, in the Grande Ronde basin. (There are also three projects in Washington, and one each in Idaho and Montana.) The objective of the program is to develop a coordinated approach to restoration and protection activities in a basin so as to avoid redundancy and ensure that programs are working together and not at cross purposes. The objective is not to develop watershed plans, since many plans have already been developed, but to identify gaps in implementation and devise ways to fill those gaps.</p> <p>The Grande Ronde project is guided by a 16-member Board of Directors appointed by Wallowa and Union Counties. The Bonneville Power Administration funds the project's Director, Assistant Director and the project office in La Grande.</p> <p>BPA also funded an assessment of the Grande Ronde basin's fish-bearing regions. The assessment, conducted by a private contractor, was based on already existing studies.</p>
Geographic Scope	In Oregon, the project operates in basin 31, Grande Ronde.

Public Assistance Not applicable.

Components:

Type (grant/loan)

Number

Eligibility criteria

Public Education

Components:

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

A public involvement program is being developed, which will include public education materials.

Funding:

Amount

Source

Timing

Coordination with other agencies

The Northwest Power Planning Council's role is to coordinate the activities of federal agencies. The Council has also been successful in persuading Congress to provide funding to Bonneville Power Administration and other entities to go forward with the Council's priorities.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Each model watershed prepares an annual report on its success in achieving the tasks outlined for the past year.

Institutional analysis:

Most successful aspects In the Grande Ronde, where the project has been in operation about one year, projects have been identified which address the priority problems.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

The multitude of agencies involved in the Grande Ronde has made coordination especially challenging. In particular, before the state's Watershed Health Initiative, there was considerable conflict among the various state agencies regarding expectations.

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	National Resource Inventory
Agency	U.S. Soil Conservation Service
Contact Person, Address, Phone	Mark Tilton Soil Conservation Service 1220 SW Third Avenue, Rm 1640 Portland, OR 97204 (503) 326-2991
Watershed Management Program Element	2 - Assessment
EPA Management Measures	All
Program Authorities (laws, ordinances)	Rural Development Act of 1972; Soil and Water Resources Conservation Act of 1977; Food Security Act of 1985; Food, Agriculture, Conservation, and Trade Act of 1990.
Program Description/ Objectives	<p>The National Resource Inventory is a multi-resource inventory of data collected at scientifically selected random sample sites every five years to determine the status, condition, and trends of the nation's soils, water, and related natural resources. All non-federal land in the country is included in the NRI. Three random points are selected in each Primary Sample Unit (PSU), which is generally 160 acres. There are 5911 PSU's in Oregon, about 4,000 of which are on non-federal lands.</p> <p>All non-federal PSU's were sampled with field visits in 1982. In 1987, about 40% of the sample points were inventoried. In 1992, all points were surveyed, with field visits to 20-25% of the points. The remainder were inventoried based on aerial photo interpretation and reference to other surveys. The same sample points have been used in all three years to enable trend analysis. The 1992 survey was completed in June, 1993, and data are currently being processed. Data will be available at the Portland Soil Conservation Service in April or May, 1994.</p> <p>The 1992 data will be in a new format, using software that will enable SCS to respond quickly to individual requests for information from users. The software will also generate a statistical measure of validity for the results of each query. Digitizing of the sample points is expected to be completed in</p>

December, 1993, and additional software available in the fall of 1994 will enable the data to be used in a GIS format.

Geographic Scope Statewide, non-federal lands.

Public Assistance Not applicable.

Components:

Type (grant/loan)

Number

Eligibility criteria

Public Education Not applicable.

Components:

Written/video (attach copy)

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount \$250,000-\$300,000 per year during data collection years;
 \$100,000 per year in other years.

Source Appropriations, U.S. Congress.

Timing Annual.

Coordination with other agencies SCS will respond to queries from other agencies.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

 The ability to analyze trends, changes, and losses or gains of farmlands and wetlands is a unique aspect of the NRI. The improved ability to respond to ad hoc queries will make the NRI a valuable resource management tool.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

The inventory's accuracy could be enhanced with additional funds to contract out the photography and obtain low-level color infrared photos for each PSU. Currently, SCS uses primarily black and white photos.

Duplication of effort**Possible improvements to effectiveness:**

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Nonpoint Source Biomonitoring Program
Agency	Oregon Department of Environmental Quality
Contact Person, Address, Phone	Rick Hafele DEQ Lab 1712 SW 11th Portland, OR 97201 (503) 229-5983
Watershed Management Program Element	2 - Assessment
EPA Management Measures	All
Program Authorities (laws, ordinances)	No specific statutory mandate.
Program Description/ Objectives	The purpose of the biomonitoring program is to assess the impacts of nonpoint source pollution on beneficial uses of the state's waters by sampling and analyzing not only physical and chemical parameters of the water column, but also by examining the health and community status of the resident biological community.
Geographic Scope	Statewide. Approximately 100 samples are taken each year from about 60 sites. Site selection is based on management needs. Current sites include sites in eastern Oregon characteristic of streams impacted by grazing; sites in western Oregon characteristic of streams impacted by forestry; sites in selected Governor's Watershed Enhancement Board project areas to assess long-term project effectiveness; sites in the Grande Ronde basin to support the State's major effort there; and about 40 sites in the Coast Range selected as reference sites, i.e., sites showing little or no impact from human activities.
Public Assistance Components: Type (grant/loan) Number Eligibility criteria	Not applicable

Public Education Not applicable

Components:

Written/video (attach copy)

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

\$91,000.

Source

\$65,000 from Clean Water Act Section 319; balance from DEQ budget.

Timing

Annual.

Coordination with other agencies

DEQ coordinates with Oregon Department of Fish and Wildlife and the Oregon Department of Forestry. DEQ also coordinates their activities with the U.S. Geological Survey, Bureau of Land Management, U.S. Forest Service, and U.S. Soil Conservation Service. The U.S. Environmental Protection Agency Region 10 coordinates a biomonitoring work group. DEQ conducted a workshop for other agencies in 1992 to facilitate interagency coordination.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

There are difficulties in accessing biotic data from other state and federal agencies. EPA has a database, BIOS, that is intended to be a comprehensive source of data from many agencies.

However, there are problems with BIOS and, as a result, few agencies actually enter their data into the system. EPA has expressed its intention to fix the problems with BIOS so that it will be a useful tool. At present, there is no clearinghouse for information about which agencies might have sampled a particular area. Even if it is known that data exists, locating and obtaining it can be difficult.

Insufficient resources, funding

The program's scope is still limited to streams impacted by grazing and forestry. At present there is no assessment of urban areas, agriculturally-impacted areas (except grazing sites), or irrigated-agriculture regions. The techniques would have to be tested and refined for each of these types of land use to determine the most sensitive indicators.

Duplication of effort**Possible improvements to effectiveness:****Acceleration or expansion of current activities****New efforts needed**

As noted above, to be an effective NPS monitoring tool throughout the state, the techniques have to be tested and refined for urban regions, agricultural regions, and irrigated regions.

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Oregon Department of Agriculture Public Information Program
Agency	Oregon Department of Agriculture
Contact Person, Address, Phone	Michael J. Wolf Project Coordinator Natural Resources Division Oregon Department of Agriculture 635 Capitol Street NE Salem, OR 97310-0110 (503) 378-3810
Watershed Management Program Element	4 - Education
EPA Management Measures	A1 - Erosion and Sedimental Control Management Measure A2 - MM for Facility Wastewater and Runoff from Confined Animal Management (Large Units) A3 - MM for Facility Wastewater and Runoff from Confined Animal Management (Small Units) A4 - Nutrient Management Measure A5 - Pesticide Management Measure A6 - Grazing Management Measure A7 - Irrigation Water Management Measure W1 - MM for Protection of Wetlands and Riparian Areas W2 - MM for Restoration of Wetlands and Riparian Areas
Program Authorities (laws, ordinances)	No specific statutory mandate.
Program Description/ Objectives	The Department of Agriculture operates a multi-faceted public education program aimed at control of nonpoint source pollution. Components include Ag in the Classroom Resource Trunks (large trunks filled with books, posters, videos, film strips, tapes, teacher's guides maintained in each Education Service District in the state and made available to elementary school teachers); Conservation Teaching Aids (videos, slide shows, notebooks and displays available on loan to teachers, Soil and Water Conservation Districts, and farm groups for use in educational projects); written handouts with suggestions for water quality improvement practices for farmers; workshops and tours emphasizing water quality improvement practices; press releases and newspaper inserts. There is also an educational component to ODA's Confined Animal Feeding Operations

Program, which is primarily a regulatory program designed to cut down on animal waste entering the state's waters.

Geographic Scope

Statewide.

Public Assistance

Not applicable.

Components:

Type (grant/loan)

Number

Eligibility criteria

Public Education

Components:

Written/video

Numerous videos, slide shows, etc.

Target audience

Small farm owners, livestock owners.

Number distributed

Method of distribution Various methods, including newspaper, newsletter inserts, press releases.

Scheduled/planned

Ongoing.

Seminars, workshops

Numerous workshops and tours.

Target audience

Small farm owners, livestock owners.

Dates and attendance

Scheduled/planned

Ongoing.

Funding:

Amount

Not separately funded.

Source

Timing

Coordination with other agencies

The Department of Agriculture works extensively through the 45 Soil and Water Conservation Districts throughout the state. In addition, ODA works closely with the Oregon State University Extension Service, the U.S. Soil Conservation Service, and the Oregon Department of Environmental Quality.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects Small, informal meetings and tours have been the most successful in reaching the target audience of small farmers.

These activities have generated a great deal of interest by both the media and small farmers.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Oregon Stage 1 Watershed Assessment
Agency	Oregon Division of State Lands, Strategic Watershed Management Group
Contact Person, Address, Phone	Ken Bierly Wetlands Program Manager Division of State Lands 775 Summer Street NE Salem, OR 97310 (503) 378-3805 x246
Watershed Management Program Element	2 - Assessment
EPA Management Measures	W1 - MM for Protection of Wetlands and Riparian Areas W2 - MM for Restoration of Wetlands and Riparian Areas
Program Authorities (laws, ordinances)	No specific statutory mandate.
Program Description/ Objectives	<p>The Oregon Stage 1 Watershed Assessment is the first step in a comprehensive Oregon Watershed Management Strategy which has been endorsed by the state's Strategic Watershed Management Group (SWMG) and the Governor's Watershed Enhancement Board (GWEB). The assessment will evaluate watershed conditions statewide using common criteria and uniform assessment methods, enabling a comparative examination of watershed health. The assessment results will be used by SWMG to prioritize watersheds and integrate state policies and programs in implementing the Watershed Management Strategy.</p> <p>Although funding for the assessment has been approved, staff have not yet been selected nor has the assessment begun. It will probably begin early in 1994 and be completed within one year.</p> <p>The assessment will use a methodology known as the "synoptic approach," which involves selecting appropriate indicators of watershed health from readily available, existing data sources. A policy steering group and technical advisory committee will define the synoptic indices to be used in the assessment and determine which data sources provide the best measures.</p>

The assessment will also use a survey to collect information related to public concern and the likelihood of successful implementation of the Watershed Management Strategy in each watershed.

After collection of data, the policy steering group will determine criteria for the priority-setting process, and will present the results at a series of five regional meetings. After public input is received and considered, a final report will be prepared.

Geographic Scope

Statewide.

Public Assistance

Not applicable.

Components:

Type (grant/loan)

Number

Eligibility criteria

Public Education

The five regional meetings will provide an opportunity to inform the public about the state's Watershed Management Strategy.

Components:

Written/video (attach copy)

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

\$130,000.

Source

\$110,000 from U.S. Environmental Protection Agency;
\$ 20,000 in in-kind services provided by SWMG agencies pursuant to a Memorandum of Agreement.

Timing

One-time only grant.

Coordination with other agencies

The Strategic Water Management Group is a 14-member group consisting of the Governor and the heads of 13 state agencies involved with water management. The Governor's Watershed Enhancement Board is also an inter-agency cooperative effort. The policy steering group convened for this project will consist of representatives of the Departments of Agriculture, Environmental Quality, Fish and Wildlife, Water Resources, Parks and Recreation, and Forestry, and the Division of State Lands.

Program effectiveness:

Standards applied

Monitoring/assessment of program

The interagency policy steering group will determine how the effectiveness of the assessment will be evaluated.

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Planning Assistance to States Program
Agency	U.S. Army Corps of Engineers
Contact Person, Address, Phone	Curt Loop Marketing Director U.S. Army Corps of Engineers Portland District P.O. Box 2946 - Ninth Floor Portland, OR 97208-2946 (503) 326-2473
Watershed Management Program Element	6 - Technical Assistance
EPA Management Measures	All
Program Authorities (laws, ordinances)	1974 Water Resources Development Act, Section 22.
Program Description/ Objectives	<p>The Planning Assistance to States (PAS) Program is a program to make the Corps of Engineers' technical assistance available to assist states in management of water and related land resources. The program's objective is to support comprehensive planning by states for the development, utilization, and conservation of water and related land resources. The program is very flexible, and can provide a variety of technical services, including studies, assessment, data base development, mapping, analysis, digitizing, and surveying. In Oregon, the PAS program has done projects for the Water Resources Department, the Division of State Lands, the Coastal Zone Management Program, and the Oregon Department of Fish and Wildlife. The actual work on the project is done by Corps personnel, and the cost is split between the Corps and the State.</p> <p>When a state agency expresses interest in a project, an agreement is negotiated between the agency and the Corps with an agreed-upon price for the work. The state agency must provide its share of the funds before the work is begun.</p>
Geographic Scope	Statewide.

Public Assistance**Components:****Type (grant/loan)**

Cost-share with state agencies.

Number

No limit on number; \$300,000 annual limit per state.

Eligibility criteria

Requested work items must be related to the state's water and related land resources plan.

Public Education

Not applicable.

Components:**Written/video****Target audience****Number distributed****Method of distribution****Scheduled/planned****Seminars, workshops****Target audience****Dates and attendance****Scheduled/planned****Funding:****Amount**

\$3,000 in projects for the present year; as much as \$30,000 in the past. The limit for each state is \$300,000.

Source

Appropriations, U.S. Congress.

Timing

Projects must be completed within a 12-month period.

**Coordination with
other agencies**

The Oregon Water Resources Department is the Corps' primary contact in Oregon. The Corps has also worked with the Coastal Management Program, the Division of State Lands, and the Oregon Department of Fish and Wildlife.

Program effectiveness:**Standards applied****Monitoring/assessment of program**

The Corps project manager monitors compliance with the contract.

Institutional analysis:**Most successful aspects****Problems experienced, e.g.:**

The program is underutilized by the State of Oregon due to the lack of funds for the required cost-sharing. The state share of the cost was phased in from 10% in 1991 to the present requirement of 50% nonfederal funds. Participation in the program has gone down as the required cost-share percentage has gone up. In the past, projects worth \$30,000 have been undertaken in the state, whereas at present only \$3,000 of work has been proposed. The program itself is in jeopardy due to its

low rate of participation.

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Partners for Environmental Progress
Agency	U.S. Army Corps of Engineers
Contact Person, Address, Phone	Curt Loop Marketing Director U.S. Army Corps of Engineers Portland District PO Box 2946 - Ninth Floor Portland, OR 97208-2946 (503) 326-2473
Watershed Management Program Element	6 - Technical assistance
EPA Management Measures	All
Program Authorities (laws, ordinances)	
Program Description/ Objectives	<p>Partners for Environmental Progress (PEP) is a new program designed to make the Corps of Engineers' planning and economic evaluation expertise available to examine opportunities to improve the environmental infrastructure and demonstrate the viability of solving problems using private resources, non-federal public resources, or a public-private partnership. The program's primary objective is to encourage greater private sector investment in water dependent environmental infrastructure, such as water supply, treatment and distribution, and all aspects of waste water management.</p> <p>The program works with small and/or disadvantaged communities and the private sector in developing a Market Feasibility Study to fully evaluate whether privatization of a particular environmental infrastructure is desirable or feasible. Feasibility studies may include action plans, needs prioritization, candidates for infrastructure privatization, financial and institutional assessment, evaluation of privatization options, and development of a draft request for proposal.</p> <p>Proposals compete nationally for funding.</p>

Geographic Scope	PEP is a national program; there are no geographic restrictions within Oregon.
Public Assistance Components:	
Type	Cost-share assistance to small and/or disadvantaged communities.
Number	No set number. Since this is a very new program, no projects have yet been done in Oregon, although one community has submitted a proposal for this fiscal year.
Eligibility criteria	A non-federal sponsor must agree to provide in-kind services of a value equal to the federal funding. Counties, local governments, water and sewer authorities, utility districts, and other public/quasi-public entities may be sponsors. States or state agencies are not eligible, although they may provide financial assistance to the sponsors so the sponsors can provide their in-kind service requirement. "Small" communities are defined as those having a service population of less than 500,000. "Disadvantaged" communities are those with unemployment rates higher than the national average or per capita income below the national average.
Public Education Components:	Not applicable.
Written/video	
Target audience	
Number distributed	
Method of distribution	
Scheduled/planned	
Seminars, workshops	
Target audience	
Dates and attendance	
Scheduled/planned	
Funding:	
Amount	Nationally, \$3-5 million is available annually. There is a limit of \$200,000 per project.
Source	Appropriations, U.S. Congress.
Timing	Annual.
Coordination with other agencies	The Corps of Engineers works closely with local sponsors in developing proposals for the program.
Program effectiveness:	As this is a new program, it is too early to assess its effectiveness.

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Pesticide State Management Plan
Agency	Oregon Department of Agriculture
Contact Person, Address, Phone	David L. Priebe Project Coordinator Oregon Department of Agriculture - Plant Division 635 Capitol Street NE Salem, OR 97310-0110 (503) 378-3776
Watershed Management Program Element	Primary Element: 4 - Education Additional Elements: 2 - Assessment 5 - Demonstration Projects 6 - Technical Assistance 10 - Enforcement
EPA Management Measures	A5 - Pesticide Management Measure F9 - Forest Chemical Management
Program Authorities (laws, ordinances)	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).
Program Description/ Objectives	<p>Oregon is now in the process of drafting its Pesticide State Management Plan to comply with the U.S. Environmental Protection Agency's Pesticides and Groundwater Strategy under FIFRA. The objective is to prevent the contamination of groundwater resulting from the normal, registered use of pesticides. Under the EPA strategy, first published in 1991, EPA will identify pesticides which present a threat to groundwater, and will then allow the use of those pesticides only in states which develop a management plan to protect groundwater from that pesticide. EPA must formally approve a state's pesticide management plan before the continued specific pesticide uses will be allowed.</p> <p>EPA published its guidance document for developing state management plans in December, 1993, and is expected to publish a proposed rule in January, 1994, listing five pesticides presenting a threat to groundwater. The rule will be finalized in 1995, and states will then most likely have one year to submit pesticide-specific management plans for the listed pesticides. Actual pesticide-specific state management plan requirements will probably first take effect during the 1996 or 1997 growing</p>

Oregon has been developing a generic state management plan which will serve as the basis for specific pesticide management plans. The generic plan will synthesize groundwater protection and pesticide management efforts in the state, including any gaps in current programs that may need to be addressed to achieve adequate pesticide management.

The specific state management plans will likely include enforceable management measures, but will also rely heavily on public information efforts, technical assistance and demonstration projects.

The federal guidance document requires the following 12 components in all state management plans, both generic and pesticide-specific:

1. State's philosophy and goals for protecting groundwater;
2. Roles and responsibilities of state agencies;
3. Legal authorities;
4. Resources devoted to the program;
5. Basis for assessment and planning;
6. Monitoring program;
7. Prevention actions;
8. Response to detections;
9. Enforcement mechanisms;
10. Public awareness and participation;
11. Information dissemination; and
12. Records and reporting.

Geographic Scope

Statewide.

Public Assistance

Not applicable.

Components:

Type (grant/loan)

Number

Eligibility criteria

Public Education

To be developed.

Components:

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance
Scheduled/planned

Funding:

Amount	\$58,000 per year.
Source	FIFRA special funding.
Timing	Annual appropriation.

**Coordination with
other agencies**

The Department of Environmental Quality, the Water Resources Department, the Health Division, Oregon State University Extension Service and the Department of Forestry will be involved in review of the generic pesticide management plan and development of pesticide-specific plans. Other states agencies, the EPA and the Soil Conservation Service of the U.S. Department of Agriculture will also be participating.

Program effectiveness: As this program is still under development, it is too early to assess its effectiveness.

Standards applied

Monitoring/assessment of program

Monitoring will be required to demonstrate that the management measures are effective in protecting groundwater resources. Although details have not yet been developed, groundwater testing will likely be a part of the monitoring effort.

EPA Regional Offices will formally evaluate each state's progress in implementing state management plans every two years.

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

- Unclear goals, responsibilities or procedures
- Conflicting efforts by other programs
- Difficulties coordinating with other programs
- Insufficient resources, funding
- Duplication of effort

Possible improvements to effectiveness:

- Acceleration or expansion of current activities
- New efforts needed
- New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Project WILD
Agency	Oregon Department of Fish and Wildlife
Contact Person, Address, Phone	Shann Weston Wildlife Education Coordinator Information and Education Division Oregon Department of Fish and Wildlife PO Box 59 Portland, OR 97207 (503) 229-5410 x427
Watershed Management Program Element	4 - Education
EPA Management Measures	W1 - MM for Protection of Wetlands and Riparian Areas W2 - MM for Restoration of Wetlands and Riparian Areas
Program Authorities (laws, ordinances)	No specific statutory mandate.
Program Description/ objectives	<p>Project WILD is a curriculum on wildlife education. The original materials were developed by the Western Regional Environmental Education Council and the fish and wildlife agencies of 13 western states. An additional book of materials called Aquatic WILD was developed by the U.S. Fish and Wildlife Service. These curricula provide supplementary educational activity guides for grades K-12. ODFW conducts workshops to teach teachers about the curriculum and how to use it, and also provides the materials to those participating in the workshops.</p> <p>Project WILD materials consist of two volumes of supplementary activities, one for elementary students, the other for secondary schools. Aquatic Project WILD is one volume of materials for grades K-12.</p>
Geographic Scope	Statewide. ODFW implements the project in Oregon; it is also used in other states.
Public Assistance Components:	Not applicable.
Type Number	

Eligibility criteria

Public Education

Components:

Written/video

Target audience Schoolchildren grades K-12 (through their teachers).

Number distributed 5180.

Method of distribution Through workshops for teachers.

Scheduled/planned Ongoing.

Seminars, workshops

Target audience Schoolteachers

Dates and attendance 229 workshops since August, 1983; 5180 teachers have attended.

Scheduled/planned Ongoing

Funding:

Amount \$33,000.

Source ODFW budget.

Timing Annual.

Coordination with other agencies

The project coordinator has worked with Oregon State University and other state colleges to conduct workshops and distribute the materials.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects The materials themselves are considered very effective by the project coordinator and the teachers participating in the workshops.

Problems experienced, e.g.:

The Oregon project coordinator believes that the materials themselves are very effective, but that implementation is the biggest problem. The curriculum materials are only available to those who participate in the workshops, which cuts down on the number that are distributed. The State of Oregon buys the books and distributes them at the workshops, which are usually provided free, or at a cost of no more than \$10. Shann Weston, the project coordinator, conducts some of the workshops herself, and has a core group of 4-5 volunteer facilitators who also conduct workshops.

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Resource Conservation and Development Program
Agency	U.S. Soil Conservation Service
Contact Person, Address, Phone	Vaughn L. Brown Assistant State Conservationist U.S. Soil Conservation Service 1220 SW Third Avenue, Room 1640 Portland, OR 97402 (503) 326-2751
Watershed Management Program Element	3 - Coordinated watershed planning 7 - Cost-share assistance
EPA Management Measures	All
Program Authorities (laws, ordinances)	P.L. 97-98.
Program Description/ Objectives	<p>The Resource Conservation and Development Program is an economic development and resource conservation program for rural communities dependent on a natural resource base. The program provides a full-time coordinator, clerical services, office space, and a small amount of seed money to authorized Resource Conservation and Development Districts. To be eligible for assistance, local sponsors must form an RC&D Council and must develop a detailed RC&D plan. Councils compete nationally for funding authorization.</p> <p>RC&D goals in Oregon include:</p> <ul style="list-style-type: none">• Forestry: Provide sustained forest yield and increase forestry-related employment.• Water: Provide an equitable distribution of water to all users, reduce flooding, and maintain or enhance water quality.• Erosion: Reduce erosion and maintain or improve soil productivity.• Land Use: Support the Land Conservation and Development Commission's goal to preserve and maintain agricultural lands.• Economic development: Improve the quality of life while benefitting the local economy.

- Rangeland: Utilize rangeland to maximize forage production, wildlife, recreation, and watershed values.

Geographic Scope

Grants are available within designated RC&D District areas. In Oregon, there are currently five project areas: Cascade-Pacific (Corvallis headquarters, basin 22 - Willamette); Northwest Oregon (Forest Grove, basin 22 - Willamette); Columbia-Blue Mountain (Pendleton, basin 27 - Umatilla); Southwest Oregon (basins 14 - South Coast and 15 - Rogue); and a joint Oregon-California region encompassing Klamath and Lake Counties in Oregon (basin 43 - Klamath) and two California counties. In addition, two local groups are in the process of developing RC&D Councils and applications: North Central Oregon (includes Hood River); and Far East Oregon (includes Baker and Malheur Counties).

Public Assistance

Components:

Type

Grants; each RC&D area receives \$10,000 - \$20,000 per year from SCS.

Number

Number depends on project costs.

Eligibility criteria

Grants may be used for projects identified in approved RC&D plans. RC&D funds cannot be more than 25% of total project cost.

Public Education

Components:

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Not applicable.

Funding:

Amount

Approximately \$440,000 in Oregon in FY 1993.

Source

Appropriations, U.S. Congress.

Timing

Annual.

Coordination with other agencies

Many local governments and agencies participate on RC&D Councils, including city and county governments, councils of government, ports, and soil and water conservation districts.

Program effectiveness:**Standards applied****Monitoring/assessment of program**

There is no required monitoring or assessment of the effectiveness of environmental aspects of the program. RC&D Councils have annual workplans which are reviewed for goal accomplishment. Input-output models are used to determine impact on the local economies.

Institutional analysis:**Most successful aspects**

The local, grassroots nature of the program enables it to mobilize local resources very effectively. The flexibility of the program and its lack of stringent, limiting criteria allow new and creative uses of federal funds. Last year, \$330,000 in federal funds were used to leverage more than \$4 million worth of development projects in Oregon.

Problems experienced, e.g.:**Unclear goals, responsibilities or procedures****Conflicting efforts by other programs****Difficulties coordinating with other programs**

In the start-up phase, some Councils have encountered resistance from other local development or governmental bodies fearing competition for scarce development funds. In reality, the resource focus of the RC&D Councils distinguishes them from existing programs, and once that is realized, the problems have been resolved. Such groups often become part of the RC&D Councils.

Insufficient resources, funding**Duplication of effort****Possible improvements to effectiveness:****Acceleration or expansion of current activities****New efforts needed****New authority**

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	River Basin Studies
Agency	U.S. Soil Conservation Service; U.S. Forest Service
Contact Person, Address, Phone	Vaughn L. Brown Assistant State Conservationist U.S. Soil Conservation Service 1220 SW Third Avenue, Room 1640 Portland, OR 97204 (503) 326-2751
Watershed Management Program Element	Primary element: 2 - Assessment Additional element: 4 - Education
EPA Management Measures	All
Program Authorities (laws, ordinances)	Watershed Protection and Flood Prevention Act, P.L. 83-566.
Program Description/ Objectives	River Basin Studies gather together existing data and information developed by federal, state, and local agencies, to develop a comprehensive, self-contained document addressing water quality and other problems in specific basins. In Oregon, only one study is undertaken at a time, and each project takes approximately two years. Proposals for river basin studies are developed by the Soil Conservation Service locally and then an application for funds is made at the national level, where the proposal competes with other proposals from other states.
Geographic Scope	A study on the Nestucca River Basin was completed in October, 1992; one on the Grande Ronde Basin is currently underway.
Public Assistance Components: Type Number Eligibility criteria	Not applicable.
Public Education Components:	SCS, the U.S. Forest Service, and the Oregon Department of Environmental Quality have contributed funds to the Grande Ronde Soil and Water Conservation District to hire a natural resource planner in connection with the River Basin Study.

Public information will be a major focus of this individual's efforts.

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

\$170,000 for FY-93; the same for FY-94.

Source

\$110,000 from SCS budget; \$60,000 from Forest Service

Timing

Annual

**Coordination with
other agencies**

Many federal, state and local agencies, as well as Indian tribes, are involved in river basin studies, including the U.S. Bureau of Reclamation, the Oregon Departments of Environmental Quality, Water Resources, Fish and Wildlife, Forestry, Agriculture, the Model Watershed program, the Northwest Power Planning Council, and the Umatilla tribes.

Program effectiveness:

Standards applied

SCS evaluates this program on a regular basis, although there are no quantitative standards for effectiveness.

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

The program's greatest success has been in pulling together information from widely varied sources to produce a document that is helpful not only for planning but for educating the general public and those involved in resource management.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Coordination with other agencies is one of the biggest challenges facing River Basin Study staff, since each agency operates under its own mandates and a slightly different focus.

Insufficient resources, funding

More funding could expand this program beyond its current scope.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed
New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Rural Clean Water Program
Agency	U.S. Agricultural Stabilization and Conservation Service
Contact Person, Address, Phone	Elizabeth (Betty) L. Lissman State Program Specialist Oregon State ASCS Office 7620 SW Mohawk, PO Box 1300 Tualatin, OR 97062 (503) 692-6830 x228
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	A2 - MM for Facility Wastewater and Runoff from Confined Animal Management (Large Units) A3 - MM for Facility Wastewater and Runoff from Confined Animal Management (Small Units)
Program Authorities (laws, ordinances)	
Program Description/ Objectives	<p>The Rural Clean Water Program was a federally-sponsored experimental effort to address nonpoint source pollution problems arising from agriculture. Nationally, 21 experimental watershed projects were funded across the country. In Oregon, the program addressed bacterial contamination of Tillamook Bay's oyster beds, which had fecal coliform levels higher than allowed for commercial shellfishing, resulting in closure of the Bay to commercial harvests. The program has provided funding for animal waste management systems for the dairies in the watershed, in particular for roofed and guttered structures for manure storage.</p> <p>The Rural Clean Water Program is in its final stages in Oregon. The program is no longer open for new applications.</p>
Geographic Scope	Tillamook County
Public Assistance Components:	
Type	Cost-share payments.
Number	
Eligibility criteria	Eligibility is now closed for this program in Oregon.

Public Education

Components:

Not applicable.

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

\$170,261 in cost-shares for year ending 9/30/93 (this is down from \$288,996 in cost-shares for the previous year).

Source

Appropriations, U.S. Congress.

Timing

Federal fiscal year, 10/1 - 9/30.

**Coordination with
other agencies**

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Fecal coliform levels have decreased in Tillamook Bay to the extent that commercial harvesting of shellfish is once again permitted. (However, levels showed an increase at some sample locations during the 1990-1992 period.)

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Salmon Trout Enhancement Program (STEP)	
Agency	Oregon Department of Fish and Wildlife	
Contact Person,	Tony Nigro	Dennis Wise
Address, Phone	Fish Division, ODFW PO Box 59 Portland, OR 97207 (503) 229-5410 x378	Columbia Regional Office, ODFW 17330 SE Evelyn Street Clackamas, OR 97015 (503) 657-6822
Watershed Management Program Element	8 - Stewardship	
EPA Management Measures	W2 - MM for Restoration of Wetland and Riparian Areas	
Program Authorities (laws, ordinances)	ORS 496.435, ORS 496.440; OAR 635-09-090 - 635-09-135.	
Program Description/ Objectives	The Salmon Trout Enhancement Program is designed to encourage and train volunteers to participate in stream surveys, restoration of salmon and trout habitat, and egg incubation programs. The survey and restoration projects are most directly related to water quality, and protect the beneficial uses of fisheries and aquatic life. All projects are supervised and managed by ODFW biologists, who also provide technical assistance for project planning and coordination with ODFW goals.	
Geographic Scope	Statewide.	
Public Assistance Components:	Not applicable.	
Type		
Number		
Eligibility criteria		
Public Education Components:	The Stream Scene is described in a separate inventory.	
Written/video		
Target audience		
Number distributed		
Method of distribution		
Scheduled/planned		

Seminars, workshops
Target audience
Dates and attendance
Scheduled/planned

Funding:

Amount

FY-93: \$933,965 total budget:
\$541,700 Wallop-Breaux (federal) funds
289,529 wildlife funds (license fees)
102,736 general funds

Source

FY-94: \$861,646 total budget (breakdown not available but this figure represents a reduction in general funds and a state cap on Wallop-Breaux funds.

Timing

Annual.

**Coordination with
other agencies**

Program effectiveness:

Standards applied

While there are no formal standards applied to assess program effectiveness, the agency does keep track of volunteer hours and in-kind donations to the program. In FY-93, 904 volunteer projects were completed, involving 7,500 people and 98,000 volunteer hours. 422 miles of stream were surveyed. \$178,000 in donated time, services and supplies were received from the public in support of this program.

Monitoring/assessment of program

Institutional analysis:

Most successful aspects Providing an avenue for the public to become involved with the agency and thus with the natural resources of the state has been one of the most successful aspects of the program.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Reduced funding for FY-94

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Shellfish Sanitation Program
Agency	Oregon Department of Agriculture
Contact Person, Address, Phone	Deb Cannon Shellfish Program Specialist Department of Agriculture, Food and Dairy Division 635 Capitol Street NE Salem, OR 97310-0110 (503) 378-3790
Watershed Management Program Element	2 - Assessment
EPA Management Measures	U7 - New Onsite Disposal Systems U8 - Operating Onsite Disposal Systems
Program Authorities (laws, ordinances)	ORS 622.180.
Program Description/ Objectives	<p>The Shellfish Sanitation Program's primary purpose is to protect the health of shellfish consumers. Formerly in the state Health Division, the program is now part of the Oregon Department of Agriculture's food safety effort. The program analyzes both water quality samples (primarily for fecal coliform) and shellfish samples (for paralytic shellfish poisoning and domoic acid), performs lot testing on commercial shellfish products, and conducts inspections of septic systems and other nonpoint pollution sources on the shorelines of commercial shellfish estuaries. The program operates a shellfish management program for the state's seven commercial shellfish areas: Nehalem Bay, Netarts Bay, Tillamook Bay, Yaquina Bay, Winchester Bay/Umpqua River, Coos Bay, and the South Slough area of Coos Bay.</p> <p>Water quality samples are collected by Shellfish Program personnel, Department of Environmental Quality personnel, and county health departments, and are all analyzed by the Department of Agriculture laboratory in Salem. Samples are collected monthly (except once every two months in Netarts Bay), and there is an annual evaluation to determine each area's classification according to U.S. Food and Drug Administration standards.</p>

Geographic Scope	Seven commercial shellfish harvesting areas: Nehalem Bay, Netarts Bay, Tillamook Bay, Yaquina Bay, Winchester Bay/Umpqua River, Coos Bay, and South Slough-Coos Bay. Basins 11 - North Coast; 12 - Mid-Coast; 13 - Umpqua; 14 - South Coast.
Public Assistance Components:	Not applicable.
Type (grant/loan)	
Number	
Eligibility criteria	
Public Education Components:	
Written/video	Flyer
Target audience	Recreational shellfishers
Number distributed	
Method of distribution	
Scheduled/planned	An update is planned.
Seminars, workshops	
Target audience	
Dates and attendance	
Scheduled/planned	
Funding:	
Amount	\$550,000 for 1993-95 biennium.
Source	State general fund appropriations; \$34,000 from commercial shellfish licensing fees.
Timing	Biennial.
Coordination with other agencies	The Shellfish Program coordinates water quality sampling with the Department of Environmental Quality and county health departments. The program contracts with county health departments for the biotoxin and water quality sampling and for the shoreline sanitary inspection work. The Department of Fish and Wildlife assists with sample collection for the biotoxin testing.
Program effectiveness:	
Standards applied	
Monitoring/assessment of program	
Institutional analysis:	
Most successful aspects	Protecting the health of shellfish consumers is the program's most successful aspect.
Problems experienced, e.g.:	
Unclear goals, responsibilities or procedures	

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Alsea Bay, Siuslaw Bay, and Coquille Bay, all of which have substantial recreational harvests, are closed to commercial shellfish harvesting because the program does not have adequate resources to conduct the shoreline surveys, monthly water quality testing, and supervision of shellfish harvesting which would be required by FDA for all commercial harvest areas.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Small Watershed Program (PL-566 Program)
Agency	U.S. Soil Conservation Service
Contact Person, Address, Phone	Vaughn L. Brown Assistant State Conservationist U.S. Soil Conservation Service 1220 SW Third Avenue, Room 1640 Portland, OR 97204 (503) 326-2751
Watershed Management Program Element	Primary element: 3 - Coordinated watershed planning Additional element: 7 - Cost-share assistance
EPA Management Measures	All
Program Authorities (laws, ordinances)	Watershed Protection and Flood Prevention Act, P.L. 83-566.
Program Description/ Objectives	<p>The Small Watershed Program provides technical and financial assistance to local public entities for coordinated watershed planning and project implementation for the purposes of watershed protection (including water quality improvement) and flood prevention. Cities, counties, ports, soil and water conservation districts, irrigation districts, and other special districts may apply through the Soil Conservation Service for federal assistance. The planning phase generally lasts one-and-one-half to two years, and places a heavy emphasis on public involvement. In addition to local groups, state and federal agencies are involved in a coordinated planning process that draws on the technical expertise of SCS field and central office staff for information regarding the watershed's resources and problems.</p> <p>In the implementation phase, federal funds can be used to pay for portions of both structural improvements and land treatment practices which have been identified in the comprehensive plan developed in the planning phase. Structural improvements are larger projects such as dams and pipelines with significant public benefits. Local sponsors must also participate in paying for structural improvements, and must have the capability, both legally and financially, to take over operation and maintenance of the structure once it is completed, at which point ownership</p>

is transferred to the local entity.

Cost-sharing is also available for land treatment practices on private land, if those practices are specified in the watershed plan. SCS pays approximately 50% of the cost of such practices.

Geographic Scope

Current projects in the planning phase are in Bear Creek (basin 15 - Rogue) and Willow Creek (basin 25 - Deschutes); current projects in implementation phase are in Stage Gulch (basin 27 - Umatilla), Dry Fork (basin 26 - John Day), Wolf Creek (basin 31 - Grande Ronde), North Powder (basin 32 - Powder), Grand Prairie (basin 22 - Willamette), and Big Nestucca (basin 11 - North Coast).

Public Assistance

Components:

Type

Number

Eligibility criteria

Cost-share payments of about 50% of cost.

- Private landowners are eligible for cost-share assistance for land treatment measures specified in watershed plan.
- Owners contract to apply and maintain practices.
- Maximum cost-share payment per farm unit is \$100,000.

Public Education

Components:

Public involvement is an important aspect of the coordinated planning process, with local sponsors usually responsible for developing specific involvement and education programs.

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

Source

Timing

Approximately \$1 million/year.

Appropriations, U.S. Congress.

Annual.

**Coordination with
other agencies**

The planning phase involves coordination with numerous local, state, and federal agencies, including local soil and water conservation districts, state Departments of Environmental

Quality and Agriculture, the U.S. Geological Survey, U.S. Bureau of Reclamation, and U.S. Fish and Wildlife Service.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Developing local "ownership" of the watershed and encouraging local responsibility for the condition of the natural resources is one of the most important outcomes of the program, and goes far to obviate the need for most costly and intrusive regulatory programs.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Agencies, interested parties, and local sponsors may have common goals but may not be open to alternative methods of achieving those goals. Sometimes these fixed ideas act as a barrier to development of achievable long-term solutions.

Difficulties coordinating with other programs

Insufficient resources, funding

Insufficient resources result in agency staff being spread thin, which can lengthen the planning process and lead to frustration on the part of local sponsors. In addition, there are more projects that could benefit from the program than there are funds to support such projects. There can be delays of three to four years before a watershed is accepted into the program.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Stewardship Incentive Program (SIP)
Agency	Oregon Department of Forestry; U.S. Forest Service; U.S. Agricultural Stabilization and Conservation Service
Contact Person, Address, Phone	Mike Barsotti Oregon Department of Forestry 2600 State Street Salem, OR 97310 (503) 945-7385
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	A1 - Erosion and Sediment Control Management Measure F6 - Site Preparation and Forest Regeneration D6 - Management Measure for Eroding Streambanks and Shorelines W1 - Management Measure for Protection of Wetlands and Riparian Areas W2 - Management Measure for Restoration of Wetland and Riparian Areas
Program Authorities (laws, ordinances)	1990 Federal Farm Bill.
Program Description/ Objectives	<p>The Stewardship Incentive Program (SIP) began in Oregon in February, 1992. It provides cost-share payments for specific integrated resource management practices designed to protect all the land's resources. The first step in the program is the design of a stewardship plan. The plan can be developed by any natural resource professional, but must be approved by ODF. Cost-sharing is available for plan development if it is designed by a private consultant. Once the plan is developed, cost-share assistance is available for a practices within these categories:</p> <ul style="list-style-type: none"> • Reforestation and afforestation: Establish or reestablish diverse stands of forest trees through planting or natural regeneration for sustainable timber production and conservation purposes. • Forest and agroforest improvement: Improve forest stand productivity, stand vigor, forest health, and the value and quality of wood products. • Windbreak and hedgerow establishment, maintenance, and renovation: Establish, maintain, and renovate

- windbreaks and hedgerows to conserve energy, protect farmsteads, livestock, and crops; and reduce soil erosion.
- Soil and water protection and improvement: Maintain or improve water quality and soil productivity on forest land and along forestland waterways.
- Riparian and wetland protection and improvement: Protect, restore, and improve riparian and wetland areas to maintain water quality and improve habitat.
- Fisheries habitat enhancement: Protect and improve habitat for native fisheries including residence and anadromous species.
- Wildlife habitat enhancement: Establish and improve permanent habitat for game and nongame wildlife species.
- Forest recreation enhancement: Establish and improve outdoor recreation activities.

Geographic Scope

Statewide.

**Public Assistance
Components:**

Type

Cost-share payments.

Number

251 projects were completed in fiscal year 1993.

Eligibility criteria

Cost-share requirements include:

- The program is for owners of nonindustrial forest lands. (Nonindustrial means less than 5,000 acres and fewer than 10 full-time employees.)
- West of the Cascades, the minimum acreage is five acres. East of the Cascades, the minimum acreage is 10 acres.
- Maximum annual payment is \$10,000 per owner. Minimum payment is \$300.
- There must be an integrated resource management plan approved by the Department of Forestry which protects all of the resources of the land before payments can be made.
- Practices must be maintained for 10 years.

**Public Education
Components:**

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Public education and technical assistance are integrated with financial assistance.

Target audience
Dates and attendance
Scheduled/planned

Funding:

Amount \$568,055 was approved in Oregon for year ending 9/30/93.
Source Appropriations, U.S. Congress.
Timing Annual.

**Coordination with
other agencies**

The U.S. Agricultural Stabilization and Conservation Service handles signups in the same manner as the cost-share programs it administers, and also issues the payments. The U.S. Forest Service administers SIP at the regional and national levels. A local Stewardship Coordinating Committee consists of landowners, interest groups, forest industry, local government and state agency representatives, and tailors the national program to Oregon's needs.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Five percent of the projects, randomly selected by practice and geographic area, will be inspected to assess program effectiveness.

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures
Conflicting efforts by other programs
Difficulties coordinating with other programs
Insufficient resources, funding

There is a far greater demand for participation than there are funds for cost-sharing, even with no publicity or outreach.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities
New efforts needed
New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Stewardship Incentive Program (SIP)
Agency	Oregon Department of Forestry; U.S. Forest Service; U.S. Agricultural Stabilization and Conservation Service
Contact Person, Address, Phone	Mike Barsotti Oregon Department of Forestry 2600 State Street Salem, OR 97310 (503) 945-7385
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	A1 - Erosion and Sediment Control Management Measure F6 - Site Preparation and Forest Regeneration D6 - Management Measure for Eroding Streambanks and Shorelines W1 - Management Measure for Protection of Wetlands and Riparian Areas W2 - Management Measure for Restoration of Wetland and Riparian Areas
Program Authorities (laws, ordinances)	1990 Federal Farm Bill.
Program Description/ Objectives	<p>The Stewardship Incentive Program (SIP) began in Oregon in February, 1992. It provides cost-share payments for specific integrated resource management practices designed to protect all the land's resources. The first step in the program is the design of a stewardship plan. The plan can be developed by any natural resource professional, but must be approved by ODF. Cost-sharing is available for plan development if it is designed by a private consultant. Once the plan is developed, cost-share assistance is available for a practices within these categories:</p> <ul style="list-style-type: none"> • Reforestation and afforestation: Establish or reestablish diverse stands of forest trees through planting or natural regeneration for sustainable timber production and conservation purposes. • Forest and agroforest improvement: Improve forest stand productivity, stand vigor, forest health, and the value and quality of wood products. • Windbreak and hedgerow establishment, maintenance, and renovation: Establish, maintain, and renovate

- windbreaks and hedgerows to conserve energy, protect farmsteads, livestock, and crops; and reduce soil erosion.
- Soil and water protection and improvement: Maintain or improve water quality and soil productivity on forest land and along forestland waterways.
- Riparian and wetland protection and improvement: Protect, restore, and improve riparian and wetland areas to maintain water quality and improve habitat.
- Fisheries habitat enhancement: Protect and improve habitat for native fisheries including residence and anadromous species.
- Wildlife habitat enhancement: Establish and improve permanent habitat for game and nongame wildlife species.
- Forest recreation enhancement: Establish and improve outdoor recreation activities.

Geographic Scope

Statewide.

**Public Assistance
Components:**

Type

Cost-share payments.

Number

251 projects were completed in fiscal year 1993.

Eligibility criteria

Cost-share requirements include:

- The program is for owners of nonindustrial forest lands. (Nonindustrial means less than 5,000 acres and fewer than 10 full-time employees.)
- West of the Cascades, the minimum acreage is five acres. East of the Cascades, the minimum acreage is 10 acres.
- Maximum annual payment is \$10,000 per owner. Minimum payment is \$300.
- There must be an integrated resource management plan approved by the Department of Forestry which protects all of the resources of the land before payments can be made.
- Practices must be maintained for 10 years.

**Public Education
Components:**

Public education and technical assistance are integrated with financial assistance.

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience
Dates and attendance
Scheduled/planned

Funding:

Amount

\$568,055 was approved in Oregon for year ending 9/30/93.

Source

Appropriations, U.S. Congress.

Timing

Annual.

**Coordination with
other agencies**

The U.S. Agricultural Stabilization and Conservation Service handles signups in the same manner as the cost-share programs it administers, and also issues the payments. The U.S. Forest Service administers SIP at the regional and national levels. A local Stewardship Coordinating Committee consists of landowners, interest groups, forest industry, local government and state agency representatives, and tailors the national program to Oregon's needs.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Five percent of the projects, randomly selected by practice and geographic area, will be inspected to assess program effectiveness.

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

There is a far greater demand for participation than there are funds for cost-sharing, even with no publicity or outreach.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Storm Water Control Program
Agency	Oregon Department of Environmental Quality
Contact Person, Address, Phone	Ranei Nomura Water Quality Division Oregon Department of Environmental Quality 811 SW Sixth Avenue Portland, OR 97204 (503) 229-5256
Watershed Management Program Element	Primary element: 1 - Standards Additional element: 10 - Enforcement
EPA Management Measures	U1 - New Development U2 - Watershed Protection U3 - Site Development U4 - Construction Site Erosion and Sediment Control U5 - Construction Site Chemical Control U6 - Existing Development U9 - Pollution Prevention U10 - Planning, Siting and Developing Roads and Highways U11 - Bridges U12 - Transportation Construction Projects U13 - Transportation Construction Site Chemical Control U14 - Operation and Maintenance of Roads, Highways and Bridges U15 - Road, Highway and Bridge Runoff Systems
Program Authorities (laws, ordinances)	Clean Water Act Section 402(p). 40 Code of Federal Regulations Sections 122, 123, and 124.
Program Description/ Objectives	Federal regulations adopted in 1990 require National Pollutant Discharge Elimination System (NPDES) permits for storm water discharges from certain industrial sites, and from large (serving more than 250,000 people) and medium (serving more than 100,000 but less than 250,000 people) municipal separate storm sewer systems. Technically these discharges are considered point sources, although much of the runoff collected in municipal storm water systems enters by way of diffuse sources. All covered municipalities have submitted their permit applications, which contain storm water management plans. Municipalities are required to treat storm water to the maximum extent practicable. A few municipalities (including Astoria and

portions of Portland) have sewer systems which combine sewage and storm water. Those systems are also required to have NPDES permits, but are covered under different regulations.

More than 900 permits have been issued to industrial dischargers of storm water under the present regulations, which constitute Phase I of the implementation of the storm water provisions of the Clean Water Act. Permits require development of a storm water pollution control plan, monitoring of storm water, and compliance with storm water discharge limitations. Construction projects including clearing, grading or excavation activities which disturb five or more acres of land are required to have a DEQ approved erosion control plan before on-site activities are started.

Phase II regulations have not yet been issued, although preliminary information suggests that they will cover 90 more types of businesses and smaller communities in urbanized areas.

Phase I exempts construction which disturbs less than five acres. In addition, many light industries are exempt if storm water is not exposed to equipment or materials, or if storm water goes to a drywell (essentially a concrete-lined hole in the ground). The less than five acre and light industry exemptions are currently being reconsidered by the U.S. Environmental Protection Agency.

Geographic Scope

Statewide.

Public Assistance

Not applicable.

Components:

Type

Number

Eligibility criteria

Public Education

Components:

Written/video

DEQ has issued written materials describing the storm water regulations.

Target audience

Businesses with standard industrial category codes covered by the regulations.

Number distributed

16,000.

Method of distribution

Mailings to all businesses with codes covered by the regulations.

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance
Scheduled/planned

Funding:

Amount

Initially, about \$500,000. Regular annual funding will be approximately \$100,000.

Source

\$200,000 from an EPA grant and \$300,000 from permit fees for the initial phase. Regular annual funding will come from permit fees.

Timing

Annual.

**Coordination with
other agencies**

DEQ has arranged for many small cities to handle the issuance of storm water permits for construction activities within their jurisdictions. Memoranda of Agreement between DEQ and the cities provide that the cities review the applicants' erosion control plans and keep the application fees.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Construction sites are frequently out of compliance with erosion control requirements, and fines are not high enough to discourage this practice. Also, application fees do not always cover the costs associated with processing construction sites applications.

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

There is insufficient staff to follow up on businesses whose industrial codes are within the Phase I regulations but who have not applied for permits. Many of these businesses may be exempt.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	The Stream Scene: Watersheds, Wildlife and People
Agency	Oregon Department of Fish and Wildlife
Contact Person, Address, Phone	William Hastie Oregon Department of Fish and Wildlife Marine Region Office 2040 SE Marine Science Drive, Bldg.3 Newport, OR 97365 (503) 867-4741
Watershed Management Program Element	4 - Education
EPA Management Measures	W1 - Protection of Wetlands and Riparian Areas W2 - Restoration of Wetlands and Riparian Areas
Program Authorities (laws, ordinances)	No specific statutory mandate.
Program Description/ Objectives	<p>The Stream Scene: Watersheds, Wildlife and People is a comprehensive curriculum package developed by ODFW staff and designed to bring watershed awareness into schools and communities. The materials begin with an overall view of watersheds and then focus on riparian areas, their component parts, and the nature of streams and the aquatic life they support. The 300-page curriculum materials include background information on various aspects of stream structure, ecology, and function, activity guides describing simulations, models, and experiments for students to undertake, study questions to integrate the material, and short bibliographies for each unit. There are links to Project WILD and Aquatic Project WILD, two other sets of curriculum materials. Appendices provide detailed information about ODFW's Salmon Trout Enhancement Program (STEP) and students and teachers are encouraged to participate in that program's stream, wildlife, and habitat surveys and to develop habitat improvement projects. The materials are written primarily for grades 6 - 12, but can be adapted for use with younger or older audiences.</p> <p>The Stream Scene does not focus exclusively on nonpoint source pollution, but significant portions are directly relevant. Chapters on water quality (discussing water temperature, dissolved oxygen, pH, and sediments) and riparian areas address</p>

both the sources and the effects of various nonpoint source pollutants.

A companion set of curriculum materials focusing on upland areas and their role in watersheds is under development, funded by the Governor's Watershed Enhancement Board.

Geographic Scope

Statewide.

Public Assistance

Not applicable.

Components:

Type

Number

Eligibility criteria

Public Education

Components:

Written/video

Target audience

Schoolchildren grades 6 - 12, but the materials can be adapted for use with younger or older audiences.

Number distributed

Approximately 4,000 (including out-of-state distribution).

Method of distribution

The materials are available for purchase for \$15 (includes shipping and handling). ODFW has conducted a number of workshops based on the materials, and staff take a sample copy and order forms to educational conferences out-of-state.

Scheduled/planned

The first edition was produced in 1990. Although there are no formal plans or funding for a revision, some changes and additions have been considered.

Seminars, workshops

Target audience

Teachers.

Dates and attendance

Five week-long seminars, sponsored by the Governor's Watershed Enhancement Board, were held after the materials were developed in 1990, and 250 teachers were trained. Shorter workshops (1-3 days) are conducted now, some in conjunction with Project WILD.

Scheduled/planned

Shorter workshops will be held periodically.

Funding:

Amount

Source

- State fishing license fees;
- Wallop-Breaux Amendment to the Federal Aid in the Sport Fish Restoration Act of 1950, a 10% federal excise tax on certain fishing and boating equipment and supplies.

Timing

State appropriations are biennial; federal funds are annual.

**Coordination with
other agencies**

The program works primarily with teachers and students, not with other agencies.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Evaluation forms are provided at the conclusion of workshops, and indicate that teachers consider The Stream Scene materials an excellent resource.

Institutional analysis:

Most successful aspects

The connections established during the workshops between ODFW field biologists and teachers facilitate learning both during the workshops and later. About half of the 250 teachers trained in the project's initial phase actually participated in local Salmon Trout Enhancement Program projects with their students.

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

At the start of the program, week-long workshops were conducted. While considered very effective, these workshops were quite demanding on staff and will not likely be reinstated. Staff now conduct shorter workshops.

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Tillamook Bay National Estuary Project
Agency	U.S. Environmental Protection Agency's National Estuary Program
Contact Person, Address, Phone	Marilyn Sigman Director Tillamook Bay National Estuary Project 4000 Blimp Avenue Tillamook, OR 97141 (503) 842-9922
Watershed Management Program Element	Primary element - 3 - Coordinated watershed planning Other possible elements: <ul style="list-style-type: none"> • 2 - Assessment • 4 - Education • 5 - Demonstration projects (likely) • 6 - Technical assistance (possible) • 7 - Cost-share assistance (possible) • 8 - Stewardship (likely).
EPA Management Measures	Potentially all
Program Authorities (laws, ordinances)	Clean Water Act, Section 320 (1987 Amendments)
Program Description/ Objectives	<p>The National Estuary Program is a joint local/state/federal effort to protect and enhance estuaries of national significance. The primary strategy of the program is to foster an integrated planning process that brings together the diverse governmental, scientific, commercial, environmental and public interest groups and organizations which have an interest in the estuary. These diverse interests work together to develop a coordinated plan, called the Comprehensive Conservation and Management Plan</p> <p>The Tillamook Bay National Estuary Project has been established to evaluate environmental problems in the watershed, develop a comprehensive management plan, and test possible solutions. At the time of this survey, the Project was in the early part of the start-up phase.</p> <p>The following project goals were developed for the nomination of Tillamook Bay to the National Estuary Program. As the</p>

program moves forward, it is likely that these goals will be reviewed and refined.

1. To achieve the water quality standards that are set to protect "beneficial uses" of the bay, which include swimming, fishing, shellfishing and use by fish and wildlife;
2. To restore and enhance the bay from the effects of sedimentation in order to improve habitat and navigation;
3. To protect and enhance spawning and rearing habitat for anadromous fish;
4. To develop a comprehensive plan for Tillamook Bay that will protect the Bay's water quality and living resources, and promote compatibility among Tillamook County's natural resource-related industries;
5. To actively apply lessons learned in Tillamook Bay to other estuaries in Oregon and the region.

Geographic Scope

That portion of the Tillamook Bay watershed within Tillamook County, Oregon.

Public Assistance

No public assistance components have been developed yet, although technical assistance and cost-share assistance are possible aspects of the program in the future.

Components:

Type (grant/loan)
Number
Eligibility criteria

Public Education

Public education and outreach will be an important aspect of the Tillamook Bay Project. The only educational materials which have been developed so far have been general descriptions of the project and updates regarding the status of start-up efforts.

Components:

Written/video (attach copy)

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

EPA provides 75% of project funds; 25% must be nonfederal funds (state, local or private) including in-kind contributions of

Amount	time, office space and equipment. (EPA) Start-up funds (first 12 months): \$155,000; for next 4 years, approximately \$400,000 - \$600,000 per year is likely.
Source	EPA.
Timing	Start-up funds were received in June, 1993.
Coordination with other agencies	The planning effort will involve federal, state, and local agencies; individuals; scientific and technical experts; business and commercial organizations; environmental groups; public interest groups, and others with an interest in the estuary. Currently, DEQ, Tillamook County, and OSU Extension are all involved in the start-up phase of the project.
Program effectiveness:	As the Tillamook Bay Project is in its start-up phase, it is too early to assess its effectiveness. Monitoring and assessment are required components of the management plan which will be developed, but monitoring objectives and techniques, as well as sources of financial support for monitoring, have not yet been established.
Standards applied	
Monitoring/assessment of program	
Institutional analysis:	
Most successful aspects	
Problems experienced, e.g.:	
Unclear goals, responsibilities or procedures	
Conflicting efforts by other programs	
Difficulties coordinating with other programs	
Insufficient resources, funding	
Duplication of effort	
Possible improvements to effectiveness:	
Acceleration or expansion of current activities	
New efforts needed	
New authority	

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Water Development Loan Program
Agency	Oregon Water Resources Department
Contact Person, Address, Phone	Roelin E. Smith Loan Program Manager Water Development Loan Program Water Resources Department 3850 Portland Rd. NE Salem, OR 97310 (503) 378-8131
Watershed Management Program Element	9 - Watershed enhancement projects
EPA Management Measures	W2 - MM for Restoration of Wetland and Riparian Areas
Program Authorities (laws, ordinances)	ORS 541.700 to 541.855; OAR 690-90-005 to 690-90-060
Program Description/ Objectives	The Water Development Loan Program, created in 1977, provides loans to develop water resources. Loans may be made for projects if the primary purpose is irrigation, drainage, community water supply for communities of less than 30,000 people, fish protection or watershed enhancement.
Geographic Scope	Statewide.
Public Assistance Components:	
Type (grant/loan)	Loan
Number	No loans have been made under this program since 1984. No loans have ever been made for fish protection or watershed enhancement.
Eligibility criteria	For fish protection, the project must be for fish screening or bypass devices, fishways, or other structures or facilities necessary or convenient for providing fish protection. For watershed enhancement, the project must be for methods or materials to restore, maintain, and enhance the biological, chemical and physical integrity of the riparian zones and associated uplands of the state's river, lake and estuary systems. All projects must provide adequate security for repayment of the loan.

Public Education Not applicable.

Components:

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

Source

Timing

**Coordination with
other agencies**

Program effectiveness:

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

For fish protection and watershed enhancement projects, unlike community water supply projects, there are no future user charges which can be used as security for the loan or a source of future loan payments. Thus, despite statutory authorization for such loans, it is unlikely that this program will, in its present form, be a likely source of funds for fish protection or watershed enhancement.

Further, despite a belief by staff and middle management that there is an interest in and a need for water development loans, top state officials have not issued any new loans under this program since 1984.

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

If loans are to be made for fish protection or watershed enhancement, there must be authority to raise funds for repayment.

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Wetlands Reserve Program
Agency	U.S. Agricultural Stabilization and Conservation Service
Contact Person, Address, Phone	Elizabeth (Betty) L. Lissman State Program Specialist Oregon State ASCS Office 7620 SW Mohawk, PO Box 1300 Tualatin, OR 97062 (503) 692-6830 x228
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	W1 - MM for Protection of Wetlands and Riparian Areas W2 - MM for Restoration of Wetlands and Riparian Areas
Program Authorities (laws, ordinances)	The Food Security Act of 1985 (P.L. 99-198), as amended by the Food, Agriculture, Conservation, and Trade Act of 1990 (P.L. 101-624).
Program Description/ Objectives	<p>The Wetlands Reserve Program is a voluntary program to provide owners of wetlands and former wetlands the opportunity to offer a permanent easement for purchase by the Secretary of Agriculture and to receive cost-share assistance to restore cropland to natural wetlands. Anticipated environmental benefits from the restoration of wetland hydrology and vegetation include restoring the functions and values of wetlands for migratory birds and other wildlife habitat; improvement of water quality; assistance in flood water retention and ground water recharge; an increase in open space; and improvement in aesthetic values of the land and environmental education.</p> <p>Permanent easements are required from the landowner, as well as a right of access to the wetland area (for management and inspection activities). Easement payments will be based on appraisals of the "as is" agricultural value of the land. A Wetlands Reserve Plan of Operation (WRPO) will be developed which will specify the manner in which the wetlands and any adjacent lands must be restored and maintained. The WRPO will identify required restoration practices, an estimate of their costs, and an implementation schedule.</p> <p>Landowners can receive only 10 percent of the total easement</p>

price per year until restoration is complete, at which point the remaining balance will be paid. Cost-share assistance will be paid to assist in the establishment of the restoration practices specified in the WRPO.

After signups are completed in the 20 participating states, ASCS will rank applications based on cost-effectiveness and on the following environmental criteria:

- habitat for migratory birds and other wildlife;
- wetland functions;
- wetland operations and maintenance;
- location significance;
- physical conditions of site.

State ASC committees may also establish up to five additional selection factors using state-specified wetland goals and objectives. Oregon's committee has decided to use the national criteria for this year's program

Geographic Scope

Statewide.

**Public Assistance
Components:**

Type (grant/loan)

Lump sum payment for easement; cost-share assistance of 75% of cost of practices to restore cropland to natural wetlands.

Number

Not yet determined.

Eligibility criteria

Eligible cropland includes:

- wetlands farmed under natural conditions;
- substantially altered lands as determined by the U.S. Soil Conservation Service;
- croplands converted before December 23, 1985.

Parcels must be at least two acres and not more than 500 acres in size.

Lands must have been planted or considered planted to an agricultural commodity in at least one of the five crop years from 1986 through 1990, and have been capable of being cropped in 1992 or 1993.

Other eligible lands include:

- riparian areas along a stream or other waterway that link wetlands protected by an easement or similar agreement;

- certain lands already subject to a Conservation Reserve Program contract;
- wetlands not otherwise eligible if the inclusion significantly adds to the functions and values of the restored wetlands.

This year's signup period is from February 28 through March 11, 1994.

Public Education

Not applicable.

Components:

Written/video

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

\$66 million for FY-94 for the 20 states which participate in the program; state allocations will be determined after signups are complete.

Source

Appropriations, U.S. Congress.

Timing

Annual.

Coordination with other agencies

The U.S. Soil Conservation Service and U.S. Fish and Wildlife Service will participate in development of a Wetlands Reserve Plan of Operations for each parcel of land in the program. The Oregon Department of Agriculture and Division of State Lands are also involved in the program. As with all the agricultural cost-share programs it administers, ASCS also works closely with the OSU Extension Service and local Soil and Water Conservation Districts.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Easement areas will be inspected periodically to ensure proper management and compliance with the Plan of Operations.

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs
Difficulties coordinating with other programs
Insufficient resources, funding
Duplication of effort
Possible improvements to effectiveness:
Acceleration or expansion of current activities
New efforts needed
New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Water Quality Incentive Program
Agency	U.S. Agricultural Stabilization and Conservation Service
Contact Person, Address, Phone	Elizabeth (Betty) L. Lissman State Program Specialist Oregon State ASCS Office 7620 SW Mohawk, PO Box 1300 Tualatin, OR 97062 (503) 692-6830 x228
Watershed Management Program Element	7 - Cost-share assistance
EPA Management Measures	A1 - Erosion and Sediment Control Management Measure A2 - MM for Facility Wastewater and Runoff from Confined Animal Management (Large Units) A3 - MM for Facility Wastewater and Runoff from Confined Animal Management (Small Units) A4 - Nutrient Management Measure A5 - Pesticide Management Measure A6 - Grazing Management Measure A7 - Irrigation Water Management Measure
Program Authorities (laws, ordinances)	Food, Agriculture, Conservation, and Trade Act of 1990.
Program Description/ Objectives	<p>The Water Quality Incentive Program is a special program operated through the U.S. Agricultural Stabilization and Conservation Service's Agricultural Conservation Program (ACP). The program provides cost-share and incentive payments for management practices designed to achieve the source reduction of nonpoint source agricultural pollutants in an environmentally and economically sound manner. Assistance is provided to:</p> <ul style="list-style-type: none"> • restore or enhance impaired water resources where agricultural nonpoint source pollution has a detrimental effect • prevent future impairments <p>WQIP payments can only be made to eligible landowners within designated project areas (see Geographic Scope section for areas</p>

in Oregon). To be eligible for participation in the program, an agricultural producer must meet the following conditions:

- the current management system must be affecting, or have the potential to affect, a water resource;
- at least two-thirds of the land that contributes, or has the potential to contribute to degradation of a water resource must be within the designated project area;
- the owner or operator must have control of the land for the contract period.

Geographic Scope

Payments are only available in Water Quality Incentive Program areas, which are selected annually. Each state submits up to 4 requests for project area approval. In Oregon, Josephine, Malheur, and Washington counties were WQIP areas in FY-93. FY-94 requests are pending for the Ontario Hydrologic Unit Area in Malheur County, the Dairy Creek portion of the Tualatin River in Washington County, the Crooked Creek Watershed in Lake County, and the Lower Umatilla Basin in Umatilla County.

Public Assistance

Components:

Type (grant/loan)

Number

Eligibility criteria

Cost-share payments and incentive payments.

5,506 acres were treated in the year ending 9/30/93.

- Total incentive payments under WQIP cannot exceed \$25 per acre. Since WQIP is part of the ACP, the \$3,500 per person annual limit on cost-share payments is applicable, and other ACP payments also count toward the \$3,500.
- There must be a conservation management plan developed in consultation with the Soil Conservation Service.
- Long-term agreements for up to 3 years are required for some of the management practices.
- Nonstructural best management practices with the potential for source reduction of agricultural pollutants are the only practices funded under this program. Examples are conservation tillage, integrated crop management systems, irrigation water management, livestock exclusion, strip cropping, and wildlife habitat

management.

Public Education

Components:

Written/video (attach copy)

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Dates and attendance

Scheduled/planned

Funding:

Amount

\$53,072 in cost-share payments during the year ending 9/30/93.

Source

Appropriations, U.S. Congress.

Timing

Federal fiscal year, 10/1 - 9/30.

**Coordination with
other agencies**

Soil and water conservation districts assist both in signing up applicants for the program and in setting priorities. The U.S. Soil Conservation Service provides technical assistance in developing the required water quality resource management plan. A State Conservation Review Group, composed of members from ASCS, SCS, the Extension Service, Oregon Department of Agriculture, and Oregon Department of Environmental Quality, provides oversight on policies and procedures.

Program effectiveness:

Standards applied

Monitoring/assessment of program

Progress reports are required from agricultural producers.

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

NONPOINT SOURCE POLLUTION PROGRAM INVENTORY

Program Name	Wetlands Water Quality Standards
Agency	Oregon Department of Environmental Quality
Contact Person, Address, Phone	Neil Mullane, Manager Standards and Assessment Section Water Quality Division Oregon Department of Environmental Quality 811 SW Sixth Avenue Portland, OR 97204 (503) 229-5284
Watershed Management Program Element	1 - Standards
EPA Management Measures	W1 - MM for Protection of Wetlands and Riparian Areas W2 - MM for Restoration of Wetlands and Riparian Areas W3 - MM for Vegetated Treatment Systems
Program Authorities (laws, ordinances)	Clean Water Act; ORS 468B.
Program Description/ Objectives	<p>DEQ is currently in the process of developing narrative standards for wetlands water quality as part of the regular triennial review of all water quality standards required by the Clean Water Act. It is anticipated that the narrative standards will apply to all discharges into wetlands, including stormwater runoff. There may be different tiers of standards applicable to different types of wetlands, i.e., natural wetlands, mitigation/enhancement constructed wetlands, and constructed wetland wastewater treatment systems. In addition, the standards may address water quantity and provide for buffer zones to protect wetland resources.</p> <p>Technical and Policy Advisory Committees are assisting DEQ in its triennial review of water quality standards. A Wetlands Technical Advisory Subcommittee consisting of experts from state natural resource agencies and the private sector was convened in March, 1993, to address the issues involved in composing wetlands water quality standards. The Subcommittee will present a final issue paper to the full Technical and Policy Advisory Committees in February or March, 1994. This will be followed by a series of public workshops around the state as part of the triennial review process. DEQ staff will present the</p>

issue paper and explain DEQ's approach to wetlands water quality. The workshops will likely be held in the late spring of 1994. In the late of 1994, proposed rules will be released for public comment and hearing. Proposed final rules are expected to be presented to the Environmental Quality Commission for adoption in late 1994.

Geographic Scope

Statewide.

Public Assistance

Not applicable.

Components:

Type (grant/loan)

Number

Eligibility criteria

Public Education

Components:

Public education/involvement seminars will be part of the triennial review process.

Written/video (attach copy)

Target audience

Number distributed

Method of distribution

Scheduled/planned

Seminars, workshops

Target audience

Existing and potential permittees, local government representatives, consultants, environmental public interest representatives and the general public.

Dates and attendance

Scheduled/planned

Mid-1994, precise dates and locations not yet determined.

Funding:

Amount

\$59,409.75 total funding.

Source

Clean Water Act Section 404, EPA Wetlands Program Grant.

Timing

Grant covers period from 1991-1994.

Coordination with other agencies

The Technical Advisory Subcommittee includes representatives of the state Departments of Fish and Wildlife and State Lands, the Environmental Protection Administration Laboratory in Corvallis and Metro and the City of Portland.

Program effectiveness:

As the standards have not yet been adopted, it is not possible to assess their effectiveness. Without the standards, DEQ's program of water quality certifications and review of state and federal permits has had limited effectiveness in protecting wetlands and their functions.

Standards applied

Monitoring/assessment of program

Institutional analysis:

Most successful aspects

Problems experienced, e.g.:

Unclear goals, responsibilities or procedures

Conflicting efforts by other programs

Difficulties coordinating with other programs

Insufficient resources, funding

Duplication of effort

Possible improvements to effectiveness:

Acceleration or expansion of current activities

New efforts needed

New authority

APPENDIX A

APPENDIX A: EPA Management Measures, Coastal Nonpoint Program

AGRICULTURE:

A1. Erosion and Sediment Control Management Measure:

Apply the erosion component of a Conservation Management System (CMS) as defined in the Field Office Technical Guide of the U.S. Department of Agriculture - Soil Conservation Service (see Appendix 2A of this chapter) to minimize the delivery of sediment from agricultural lands to surface waters, or

Design and install a combination of management and physical practices to settle the settleable solids and associated pollutants in runoff delivered from the contributing area for storms of up to and including a 10-year, 24-hour frequency.

A2. Management Measure for Facility Wastewater and Runoff from Confined Animal Facility Management (Large Units):

Limit the discharge from the confined animal facility to surface waters by:

- (1) Storing both the facility wastewater and the runoff from confined animal facilities that is caused by storms up to and including a 25-year, 24-hour frequency storm. Storage structures should:

- (a) Have an earthen lining or plastic membrane lining, or
- (b) Be constructed with concrete, or
- (c) Be a storage tank;

and

- (2) Managing stored runoff and accumulated solids from the facility through an appropriate waste utilization system.

A3. Management Measure for Facility Wastewater and Runoff from Confined Animal Facility Management (Small Units):

Design and implement systems that collect solids, reduce contaminant concentrations, and reduce runoff to minimize the discharge of contaminants in both facility wastewater and in runoff that is caused by storms up to and including a 25-year, 24-hour frequency storm. Implement these systems to substantially reduce significant increases in pollutant loadings to ground water.

Manage stored runoff and accumulated solids from the facility through an appropriate waste utilization system.

A4. Nutrient Management Measure:

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

- (1) Farm and field maps showing acreage, crops, soils, and waterbodies.
- (2) Realistic yield expectations for the crop(s) to be grown, based primarily on the producer's actual yield history, State Land Grant University yield expectations for the soil series, or SCS Soils-5 information for the soils series.
- (3) A summary of the nutrient resources available to the producer, which at a minimum include:
 - Soil test results for pH, phosphorus, nitrogen, and potassium;
 - Nutrient analysis of manure, sludge, mortality compost (birds, pigs, etc.), or effluent (if applicable);
 - Nitrogen contribution to the soil from legumes grown in the rotation (if applicable);
 - Other significant nutrient sources (e.g., irrigation water).
- (4) An evaluation of field limitations based on environmental hazards or concerns, such as:
 - Sinkholes, shallow soils over fractured bedrock, and soils with high leaching potential,
 - Lands near surface water,
 - Highly erodible soils, and
 - Shallow aquifers.
- (5) Use of the limiting nutrient concept to establish the mix of nutrient sources and requirements for the crop based on a realistic yield expectation.
- (6) Identification of timing and application methods for nutrients to: provide nutrients at rates necessary to achieve realistic crop yields; reduce losses to the

environment; and avoid applications as much as possible to frozen soil and during periods of leaching or runoff.

- (7) Provisions for the proper calibration and operation of nutrient application equipment.

A5. Pesticide Management Measure:

To reduce contamination of surface water and ground water from pesticides:

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

A6. Grazing Management Measure:

Protect range, pasture, and other grazing lands:

- (1) By implementing one or more of the following to protect sensitive areas (such as streambanks, wetlands, estuaries, ponds, lake shores, and riparian zones):
 - (a) Exclude livestock,
 - (b) Provide stream crossings or hardened watering access for drinking,
 - (c) Provide alternative drinking water locations,

- (d) Locate salt and additional shade, if needed, away from sensitive areas, or
- (e) Use improved grazing management (e.g., herding)

to reduce the physical disturbance and reduce direct loading of animal waste and sediment caused by livestock; and

- (2) By achieving either of the following on all range, pasture, and other grazing lands not addressed under (1):
 - (a) Implement the range and pasture components of a Conservation Management System (CMS) as defined in the Field Office Technical Guide of the USDA-SCS (see Appendix 2A of this chapter) by applying the progressive planning approach of the USDA-Soil Conservation Service (SCS) to reduce erosion, or
 - (b) Maintain range, pasture, and other grazing lands in accordance with activity plans established by either the Bureau of Land Management of the U.S. Department of the Interior or the Forest Service of USDA.

A7. Irrigation Water Management:

To reduce nonpoint source pollution of surface waters caused by irrigation:

- (1) Operate the irrigation system so that the timing and amount of irrigation water applied match crop water needs. This will require, as a minimum: (a) the accurate measurement of soil-water depletion volume and the volume of irrigation water applied, and (b) uniform application of water.
- (2) When chemigation is used, include backflow preventers for wells, minimize the harmful amounts of chemigated waters that discharge from the edge of the field, and control deep percolation. In cases where chemigation is performed with furrow irrigation systems, a tailwater management system may be needed.

The following limitation and special conditions apply:

- (1) In some locations, irrigation return flows are subject to other water rights or are required to maintain stream flow. In these special cases, on-site reuse could be precluded and would not be considered part of the management measure for such locations.
- (2) By increasing the water use efficiency, the discharge volume from the system will usually be reduced. While the total pollutant load may be reduced somewhat, there is the potential for an increase in the concentration of pollutants in the discharge. In these special cases, where living resources or

human health may be adversely affected and where other management measures (nutrients and pesticides) do not reduce concentrations in the discharge, increasing water use efficiency would not be considered part of the management measure.

- (3) In some irrigation districts, the time interval between the order for and the delivery of irrigation water to the farm may limit the irrigator's ability to achieve the maximum on-farm application efficiencies that are otherwise possible.
- (4) In some locations, leaching is necessary to control salt in the soil profile. Leaching for soil control should be limited to the leaching requirement for the root zone.
- (5) Where leakage from delivery systems or return flows supports wetlands or wildlife refuges, it may be preferable to modify the system to achieve a high level of efficiency and then divert the "saved water" to the wetland or wildlife refuge. This will improve the quality of water delivered to wetlands or wildlife refuges by preventing the introduction of pollutants from irrigated lands to such diverted water.
- (6) In some locations, sprinkler irrigation is used for frost or freeze protection, or for crop cooling. In these special cases, applications should be limited to the amount necessary for crop protection, and applied water should remain on-site.

FORESTRY:

F1. Preharvest Planning:

Perform advance planning for forest harvesting that includes the following elements where appropriate:

- (1) Identify the area to be harvested including location of waterbodies and sensitive areas such as wetlands, threatened or endangered aquatic species habitat areas, or high-erosion-hazard areas (landslide-prone areas) within the harvest unit.
- (2) Time the activity for the season or moisture conditions when the least impact occurs.
- (3) Consider potential water quality impacts and erosion and sedimentation control in the selection of silvicultural and regeneration systems, especially for harvesting and site preparation.
- (4) Reduce the risk of occurrence of landslides and severe erosion by identifying high-erosion-hazards areas and avoiding harvesting in such areas to the extent

- practicable.
- (5) consider additional contributions from harvesting or roads to any known existing water quality impairments or problems in watersheds of concern.

Perform advance planning for forest road systems that includes the following elements where appropriate:

- (1) Locate and design road systems to minimize, to the extent practicable, potential sediment generation and delivery to surface waters. Key components are:
 - locate roads, landing, and skid trails to avoid to the extent practicable steep grades and steep hillslope areas, and to decrease the number of stream crossings;
 - avoid to the extent practicable locating new roads and landings in Streamside Management Areas (SMAs); and
 - determine road usage and select the appropriate road standard.
- (2) Locate and design temporary and permanent stream crossings to prevent failure and control impacts from the road system. Key components are:
 - size and site crossing structures to prevent failure;
 - for fish-bearing streams, design crossing to facilitate fish passage.
- (3) Ensure that the design of road prism and the road surface drainage are appropriate to the terrain and that road surface design is consistent with the road drainage structures.
- (4) Use suitable materials to surface roads planned for all-weather use to support truck traffic.
- (5) Design road systems to avoid high erosion or landslide hazard areas. Identify these areas and consult a qualified specialist for design of any roads that must be constructed through these areas.

Each state should develop a process (or utilize an existing process) that ensures that the management measures in this chapter are implemented. Such a process should include appropriate notification, compliance audits, or other mechanisms for forestry activities with the potential for significant adverse nonpoint source effects based on the type and size of operation and the presence of stream crossings or SMAs.

F2. Streamside Management Areas (SMAs):

Establish and maintain a streamside management area along surface waters, which is sufficiently wide and which includes a sufficient number of canopy species to buffer against detrimental changes in the temperature regime of the waterbody, to provide bank stability, and to withstand wind damage. Manage the SMA in such a way as to protect against soil disturbance in the SMA and delivery to the stream of sediments and nutrients generated by forestry activities, including harvesting. Manage the SMA canopy species to provide a sustainable source of large woody debris needed for

instream channel structure and aquatic species habitat.

F3. Road Construction/Reconstruction:

- (1) Follow preharvest planning (as described under Management Measure F1) when constructing or reconstructing the roadway.
- (2) Follow designed planned under Management Measure F1 for road surfacing and shaping.
- (3) Install road drainage structures according to designs planned under Management Measure F1 and regional storm return period and installation specifications. Match these drainage structures with terrain features and with road surface and prism designs.
- (4) Guard against the production of sediment when installing stream crossings.
- (5) Protect surface waters from slash and debris material from roadway clearing.
- (6) Use straw bales, silt fences, mulching, or other favorable practices on disturbed soils on unstable cuts, fills, etc.
- (7) Avoid constructing new roads in SMAs to the extent practicable.

F4. Road Management:

- (1) Avoid using roads where possible for timber hauling or heavy traffic during wet or thaw periods on roads not designed and constructed for these conditions.
- (2) Evaluate the future need for a road and close roads that will not be needed. Leave closed roads and drainage channels in a stable condition to withstand storms.
- (3) Remove drainage crossings and culverts if there is a reasonable risk of plugging or failure from lack of maintenance.
- (4) Following completion of harvesting, close and stabilize temporary spur roads and seasonal roads to control and direct water away from the roadway. Remove all temporary stream crossings.
- (5) Inspect roads to determine the need for structural maintenance. Conduct maintenance practices, when conditions warrant, including cleaning and replacement of deteriorated structures and erosion controls, grading or seeding of road surfaces, and, in extreme cases, slope stabilization or removal of road fills where necessary to maintain structural integrity.
- (6) Conduct maintenance activities, such as dust abatement, so that chemical contaminants or pollutants are not introduced into surface waters to the extent practicable.
- (7) Properly maintain permanent stream crossings and associated fills and approaches to reduce the likelihood (a) that stream overflow will divert onto roads, and (b) that fill erosion will occur if the drainage structures become obstructed.

F5. Timber Harvesting:

The timber harvesting management measure consists of implementing the following:

- (1) Timber harvesting operations with skid trails or cable yarding follow layouts determined under Management Measure F1.
- (2) Install landing drainage structures to avoid sedimentation to the extent practicable. Disperse landing drainage over sideslopes.
- (3) Construct landings away from steep slopes and reduce the likelihood of fill slope failures. Protect landing surfaces used during wet periods. Locate landings outside of SMAs.
- (4) Protect stream channels and significant ephemeral drainages from logging debris and slash material.
- (5) Use appropriate areas for petroleum storage, draining, dispensing. Establish procedures to contain and treat spills. Recycle or properly dispose of all waste materials.

For cable yarding:

- (1) Limit yarding corridor gouge or soil plowing by properly locating cable yarding landings.
- (2) Locate corridors for SMAs following Management Measure F2.

For groundskidding:

- (1) Within SMAs, operate groundskidding equipment only at stream crossings to the extent practicable. In SMAs, fell and endline trees to avoid sedimentation.
- (2) Use improved stream crossings for skid trails which cross flowing drainages. Construct skid trails to disperse runoff and with adequate drainage structures.
- (3) On steep slopes, use cable systems rather than groundskidding where groundskidding may cause excessive sedimentation.

F6. Site Preparation and Forest Regeneration:

Confine on-site potential NPS pollution and erosion resulting from site preparation and the regeneration of forest stands. The components of the management measure for site preparation and regeneration are:

- (1) Select a method of site preparation and regeneration suitable for the site conditions.
- (2) Conduct mechanical tree planting and ground-disturbing site preparation activities on the contour of sloping terrain.
- (3) Do not conduct mechanical site preparation and mechanical tree planting in streamside management areas.
- (4) Protect surface waters from logging debris and slash material.
- (5) Suspend operations during wet periods if equipment used begins to cause

- excessive soil disturbance that will increase erosion.
- (6) Locate windrows at a safe distance from drainages and SMAs to control movement of the material during high runoff conditions.
 - (7) Conduct bedding operations in high-water-table areas during dry periods of the year. Conduct bedding in sloping areas on the contour.
 - (8) Protect small ephemeral drainages when conducting mechanical tree planting.

F7. Fire Management:

Prescribe fire for site preparation and control or suppress wildfire in a manner which reduces potential nonpoint source pollution of surface waters:

- (1) Intense prescribed fire should not cause excessive sedimentation due to the combined effect of removal of canopy species and the loss of soil-binding ability of subcanopy and herbaceous vegetation roots, especially in SMAs, in streamside vegetation for small ephemeral drainages, or on very steep slopes.
- (2) Prescriptions for prescribed fire should protect against excessive erosion or sedimentation to the extent practicable.
- (3) All bladed firelines, for prescribed fire and wildfire, should be plowed on contour or stabilized with water bars and/or other appropriate techniques if needed to control excessive sedimentation or erosion of the fireline.
- (4) Wildfire suppression and rehabilitation should consider possible NPS pollution of watercourses, while recognizing the safety and operational priorities of fighting wildfires.

F8. Revegetation of Disturbed Areas:

Reduce erosion and sedimentation by rapid revegetation of areas disturbed by harvesting operations or road construction:

- (1) Revegetate disturbed areas (using seeding or planting) promptly after completion of the earth-disturbing activity. Local growing conditions will dictate the timing for establishment of vegetative cover.
- (2) Use mixes of species and treatments developed and tailored for successful vegetation establishment for the region or area.
- (3) Concentrate revegetation efforts initially on priority areas such as disturbed areas in SMAs or the steepest areas of disturbance near drainages.

F9. Forest Chemical Management:

Use chemicals when necessary for forest management in accordance with the following to reduce nonpoint source pollution impacts due to the movement of forest chemicals off-site during and after application:

- (1) Conduct applications by skilled and, where required, licensed applicators according to the registered use, with special consideration given to impacts to nearby surface waters.
- (2) Carefully prescribe the type and amount of pesticides appropriate for the insect, fungus, or herbaceous species.
- (3) Prior to applications of pesticides and fertilizers, inspect the mixing and loading process and the calibration of equipment, and identify the appropriate weather conditions, the spray area, and buffer areas for surface waters.
- (4) Establish and identify buffer areas for surface waters. (This is especially important for aerial applications.)
- (5) Immediately report accidental spills of pesticides or fertilizers into surface waters to the appropriate State agency. Develop an effective spill contingency plan to contain spills.

F10. Wetlands Forest:

Plan, operate, and manage normal, ongoing forestry activities (including harvesting, road design and construction, site preparation and regeneration, and chemical management) to adequately protect the aquatic functions of forested wetlands.

URBAN:

Urban Runoff:

U1. New Development Management Measure:

- (1) By design or performance:
 - (a) After construction has been completed and the site is permanently stabilized, reduce the average annual total suspended solid (TSS) loadings by 80 percent. For the purposes of this measure, an 80 percent TSS reduction is to be determined on an average annual basis,* [*Based on the average annual TSS loadings from all storms less than or equal to the 2-year/24-hour storm. TSS loadings from storms greater than the 2-year/24-hour storm are not expected to be included in the calculation of the average annual TSS loadings.] or
 - (b) Reduce the postdevelopment loadings of TSS so that the average annual TSS loadings are no greater than predevelopment loadings, and
- (2) To the extent practicable, maintain postdevelopment peak runoff rate and average volume at levels that are similar to predevelopment levels.

Sound watershed management requires that both structural and nonstructural measures be employed to mitigate the adverse impacts of storm water. Nonstructural Management Measures U2 and U3 can be effectively used on conjunction with Management Measure U1 to reduce both the short- and long-term costs of meeting the treatment goals of this management measure.

U2. Watershed Protection Management Measure:

Develop a watershed protection program to:

- (1) Avoid conversion, to the extent practicable, of areas that are particularly susceptible to erosion and sediment loss;
- (2) Preserve areas that provide important water quality benefits and/or are necessary to maintain riparian and aquatic biota; and
- (3) Site development, including roads, highways, and bridges, to protect to the extent practicable the natural integrity of waterbodies and natural drainage systems.

U3. Site Development Management Measure:

Plan, designs, and develop sites to:

- (1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss;
- (2) Limit increases of impervious areas, except where necessary;
- (3) Limit land disturbance activities such as clearing and grading, and cut and fill to reduce erosion and sediment loss; and
- (4) Limit disturbance of natural drainage features and vegetation.

Construction Activities:

U4. Construction Site Erosion and Sediment Control Management Measure:

- (1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction, and
- (2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

U5. Construction Site Chemical Control Management Measure:

- (1) Limit application, generation, and migration of toxic substances;
- (2) Ensure the proper storage and disposal of toxic materials; and
- (3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.

Existing Development:

U6. Existing Development Management Measure:

Develop and implement watershed management programs to reduce runoff pollutant concentrations and volumes from existing development:

- (1) Identify priority local and/or regional watershed pollutant reduction opportunities, e.g., improvements to existing urban runoff control structures;
- (2) Contain a schedule for implementing appropriate controls;
- (3) Limit destruction of natural conveyance systems; and
- (4) Where appropriate, preserve, enhance, or establish buffers along surface waterbodies and their tributaries.

Onsite Disposal Systems:

U7. New Onsite Disposal Systems:

- (1) Ensure that new Onsite Disposal Systems (OSDS) are located, designed, installed, operated, inspected, and maintained to prevent the discharge of pollutants to the surface of the ground and to the extent practicable reduce the discharge of pollutants into ground waters that are closely hydrologically connected to surface waters. Where necessary to meet these objectives: (a) discourage the installation of garbage disposals to reduce hydraulic and nutrient loadings; and (b) where low-volume plumbing fixtures have not been installed in new developments or redevelopments, reduce total hydraulic loadings to the OSDS by 25 percent. Implement OSDS inspection schedules for preconstruction, construction, and postconstruction.
- (2) Direct placement of OSDS away from unsuitable areas. Where OSDS placement in unsuitable [sic] areas is not practicable, ensure that the OSDS is designed or sited at a density so as not to adversely affect surface waters or

ground water that is closely hydrologically connected to surface water. Unsuitable areas include, but are not limited to, areas with poorly or excessively drained soils; areas with shallow water tables or areas with high seasonal water tables; areas overlaying fractured bedrock that drain directly to ground water; areas within floodplains; or areas where nutrient and/or pathogen concentrations in the effluent cannot be sufficiently treated or reduced before the effluent reaches sensitive waterbodies.

- (3) Establish protective setbacks from surface waters, wetlands, and floodplains for conventional as well as alternative OSDS. The lateral setbacks should be based on soil type, slope, hydrologic factors, and type of OSDS.
- (4) Establish protective separation distances between OSDS system components and groundwater which is closely hydrologically connected to surface waters. The separation distances should be based on soil type, distance to ground water, hydrologic factors, and type of OSDS;
- (5) Where conditions indicate that nitrogen-limited surface waters may be adversely affected by excess nitrogen loadings from ground water, require the installation of OSDS that reduce total nitrogen loadings by 50 percent to ground water that is closely hydrologically connected to surface water.

U8. Operating Onsite Disposal Systems Management Measure:

- (1) Establish and implement policies and systems to ensure that existing OSDS are operated and maintained to prevent the discharge of pollutants to the surface of the ground and to the extent practicable reduce the discharge of pollutants into ground waters that are closely hydrologically connected to surface waters. Where necessary to meet these objectives, encourage the reduced use of garbage disposals, encourage the use of low-volume plumbing fixtures, and reduce total phosphorus loadings to the OSDS by 15 percent (if the use of low-level phosphate detergents has not been required or widely adopted by OSDS users). Establish and implement policies that require an OSDS to be repaired, replaced, or modified where the OSDS fails, or threatens or impairs surface waters;
- (2) Inspect OSDS at a frequency adequate to ascertain whether OSDS are failing;
- (3) Consider replacing or upgrading OSDS to treat influent so that total nitrogen loadings in the effluent are reduced by 50 percent. This provision applies only:
 - (a) where conditions indicate that nitrogen-limited surface waters may be adversely affected by significant ground water nitrogen loadings from

OSDS, and

- (b) where nitrogen loadings from OSDS are delivered to ground water that is closely hydrologically connected to surface water.

Pollution Prevention:

U9. Pollution Prevention Management Measure:

Implement pollution prevention and education programs to reduce nonpoint source pollutants generated from the following activities, where applicable:

- The improper storage, use, and disposal of household hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc.;
- Lawn and garden activities, including the application and disposal of lawn and garden care products, and the improper disposal of leaves and yard trimmings;
- Turf management on golf courses, parks, and recreational areas;
- Improper operation and maintenance of onsite disposal systems;
- Discharge of pollutants into storm drains including floatables, waste oil, and litter;
- Commercial activities including parking lots, gas stations, and other entities not under NPDES purview; and
- Improper disposal of pet excrement.

Roads, Highways, and Bridges:

U10. Management Measure for Planning, Siting, and Developing Roads and Highways:

Plan, site, and develop roads and highways to:

- (1) Protect areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss;
- (2) Limit land disturbance such as clearing and grading and cut and fill to reduce erosion and sediment loss; and
- (3) Limit disturbance of natural drainage features and vegetation.

U11. Management Measure for Bridges:

Site, design, and maintain bridge structures so that sensitive and valuable aquatic ecosystems and areas providing important water quality benefits are protected from adverse effects.

U12. Management Measure for Construction Projects:

- (1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction and
- (2) Prior to land disturbance, prepare and implement an approved erosion control plan or similar administrative document that contains erosion and sediment control provisions.

U13. Management Measure for Construction Site Chemical Control:

- (1) Limit the application, generation, and migration of toxic substances;
- (2) Ensure the proper storage and disposal of toxic materials; and
- (3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface water.

U14. Management Measure for Operation and Maintenance:

Incorporate pollution prevention procedures into the operation and maintenance of roads, highways, and bridges to reduce pollutant loadings to surface waters.

U15. Management Measure for Road, Highway, and Bridge Runoff Systems:

Develop and implement runoff management systems for existing roads, highways, and bridges to reduce runoff pollutant concentrations and volumes entering surface waters.

- (1) Identify priority and watershed pollutant reduction opportunities (e.g., improvements to existing urban runoff control structures); and
- (2) Establish schedules for implementing appropriate controls.

MARINAS:

Marina Siting and Design:

M1. Marina Flushing Management Measure:

Site and design marinas such that tides and/or currents will aid in flushing of the site or renew its water regularly.

M2. Water Quality Assessment Management Measure:

Assess water quality as part of marina siting and design.

M3. Habitat Assessment Management Measure:

Site and design marinas to protect against adverse effects on shellfish resources, wetlands, submerged aquatic vegetation, or other important riparian and aquatic habitat areas as designated by local, State, or Federal governments.

M4. Shoreline Stabilization Management Measure:

Where shoreline erosion is a nonpoint source pollution problem, shorelines should be stabilized. Vegetative methods are strongly preferred unless structural methods are more cost effective, considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other shorelines and offshore areas.

M5. Storm Water Runoff Management Measure:

Implement effective runoff control strategies which include the use of pollution prevention activities and the proper design of hull maintenance areas.

Reduce the average annual loadings of total suspended solids (TSS) in runoff from hull maintenance areas by 80 percent. For the purposes of this measure, an 80 percent reduction of TSS is to be determined on an average annual basis.

M6. Fueling Station Design Management Measure:

Design fueling stations to allow for ease in cleanup of spills.

M7. Sewage Facility Management Measure:

Install pumpout, dump station, and restroom facilities where needed at new and expanding marinas to reduce the release of sewage to surface waters. Design these facilities to allow ease of access and post signage to promote use by the boating

public.

Marina and Boat Operation and Maintenance:

M8. Solid Waste Management Measure:

Properly dispose of solid wastes produced by the operation, cleaning, maintenance, and repair of boats to limit entry of solid wastes to surface waters.

M9. Fish Waste Management Measure:

Promote sound fish waste management through a combination of fish-cleaning restrictions, public education, and proper disposal of fish waste.

M10. Liquid Material Management Measure:

Provide and maintain appropriate storage, transfer, containment, and disposal facilities for liquid material, such as oil, harmful solvents, antifreeze, and paints, and encourage recycling of these materials.

M11. Petroleum Control Management Measure:

Reduce the amount of fuel and oil from boat bilges and fuel tank air vents entering marina and surface waters.

M12. Boat Cleaning Management Measure:

For boats that are in the water, perform cleaning operations to minimize, to the extent practicable, the release to surface waters of (a) harmful cleaners and solvents and (b) paint from in-water hull cleaning.

M13. Public Education Management Measure:

Public education/outreach/training programs should be instituted for boaters, as well as marina owners and operators, to prevent improper disposal of polluting material.

M14. Maintenance of Sewage Facilities Management Measure:

Ensure that sewage pumpout facilities are maintained in operational condition and encourage their use.

M15. Boat Operation Management Measure (applies to boating only):

Restrict boating activities where necessary to decrease turbidity and physical

destruction of shallow-water habitat.

HYDROMODIFICATION:

Channelization and Channel Modification:

H1. Management Measure for Physical and Chemical Characteristics of Surface Waters:

- (1) Evaluate the potential effects of proposed channelization and channel modification on the physical and chemical characteristics of surface waters in coastal areas;
- (2) Plan and design channelization and channel modification to reduce undesirable impacts; and
- (3) Develop an operation and maintenance program for existing modified channels that includes identification and implementation of opportunities to improve physical and chemical characteristics of surface waters in those channels.

H2. Instream and Riparian Habitat Restoration Management Measure:

- (1) Evaluate the potential effects of proposed channelization and channel modification on instream and riparian habitat in coastal areas;
- (2) Plan and design channelization and channel modification to reduce undesirable impacts; and
- (3) Develop an operation and maintenance program with specific timetables for existing modified channels that includes identification of opportunities to restore instream and riparian habitat in those channels.

Dams:

H3. Management Measure for Erosion and Sediment Control:

- (1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction, and
- (2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

H4. Management Measure for Chemical and Pollutant Control:

- (1) Limit application, generation, and migration of toxic substances;
- (2) Ensure the proper storage and disposal of toxic materials; and
- (3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.

H5. Management Measure for Protection of Surface Water Quality and Instream and Riparian Habitat:

Develop and implement a program to manage the operation of dams in coastal areas that includes an assessment of:

- (1) Surface water quality and instream and riparian habitat and potential for improvement and
- (2) Significant nonpoint source pollution problems that result from excessive surface water withdrawals.

Streambank and Shoreline Erosion:

H6. Management Measures for Eroding Streambanks and Shorelines:

- (1) Where streambank or shoreline erosion is a nonpoint source pollution problem, streambanks and shorelines should be stabilized. Vegetative methods are strongly preferred unless structural methods are more cost-effective, considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other streambanks, shorelines, and offshore areas.
- (2) Protect streambank and shoreline features with the potential to reduce NPS pollution.
- (3) Protect streambank and shorelines from erosion due to uses of either the shorelands or adjacent surface waters.

PROTECTION OF WETLANDS AND RIPARIAN AREAS:

W1. Management Measure for Protection of Wetlands and Riparian Areas:

Protect from adverse effects wetlands and riparian areas that are serving a significant NPS abatement function and maintain this function while protecting the other existing

functions of these wetlands and riparian areas as measured by characteristics such as vegetative composition and cover, hydrology of surface water and ground water, geochemistry of the substrate, and species composition.

W2. Management Measure for Restoration of Wetland and Riparian Areas:

Promote the restoration of the preexisting functions in damaged and destroyed wetlands and riparian systems in areas where the systems will serve a significant NPS pollution abatement function.

W3. Management Measure for Vegetated Treatment Systems:

Promote the use of engineered vegetated treatment systems such as constructed wetlands or vegetated filter strips where these systems will serve a significant NPS pollution abatement function.