Washington's
Water Quality Management Plan
to Control Nonpoint Sources of Pollution

FINAL

June 2005

Department of Ecology
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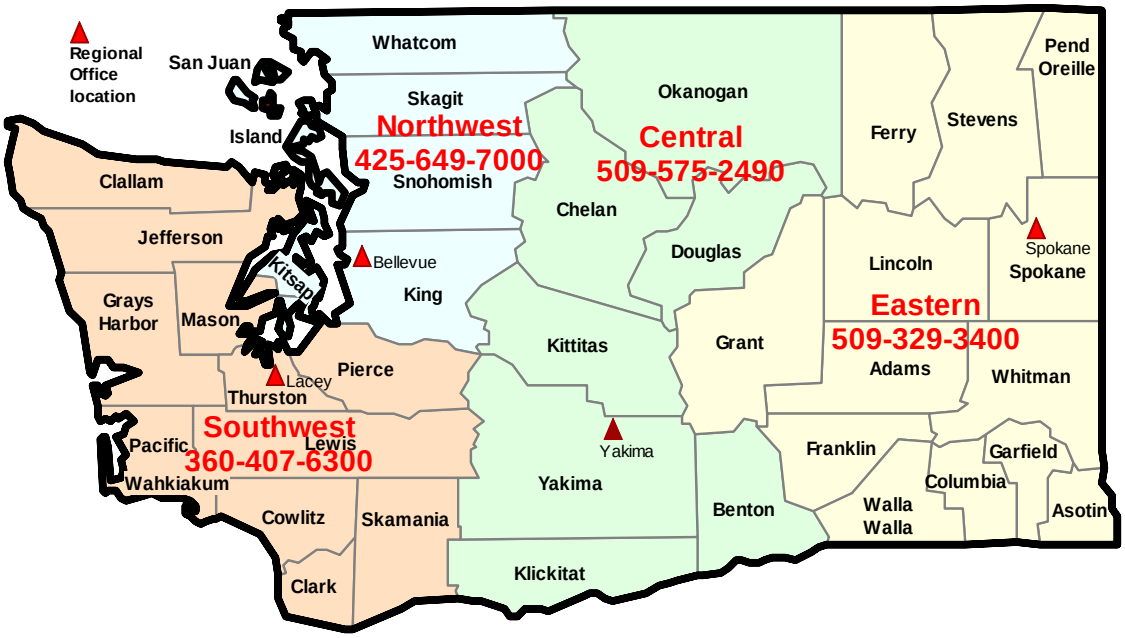

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The Nonpoint Plan

This plan has been a cooperative effort of the following agencies:

Department of Agriculture
Department of Community, Trade and Economic Development
Conservation Commission
Washington State University, Cooperative Extension
Department of Ecology
Department of Fish and Wildlife
Department of Health
Department of Natural Resources
Parks and Recreation Commission
Puget Sound Action Team
Department of Transportation

These agencies will also be implementing the actions identified in the plan.

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Acknowledgements

This plan has taken the effort of many people and agencies. Thanks goes to Washington State Nonpoint Source Workgroup: Kirk Cook, Department of Agriculture; Stu Trefry from the Conservation Commission; Chris Parsons, Community Trade and Economic Development; Bob Simmons, WSU Cooperative Extension; Selden Hall, Department of Health; Carol Walters, Department of Natural Resources, Chris Regan, Parks and Recreation Commission; Harriet Beale, Puget Sound Action Team; Tim Hilliard, Department of Transportation.

Within the Department of Ecology, many hands have helped. Thanks especially goes to Ann Butler, Lauren Stalmaster, Melissa Gildersleeve, Kelsey Highfill, but mostly to Helen Bresler for her willingness to have a conversation about the tone, direction, and emphasis of this plan.

Washington's Nonpoint Source Management Plan
Volume 3

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Abbreviations and Acronyms

Abbreviation	Agency, Organization or Program
AFO, CAFO	Animal Feeding Operation, Concentrated Animal Feeding Operation
AGC	Associated General Contractors
BMPs	Best Management Practices
CC	Washington State Conservation Commission
COE	US Army Corps of Engineers
CCWF	Centennial Clean Water Fund
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CIDMP	Comprehensive Irrigation District Management Plan
CRAB	Washington State County Roads Administration Board
CREP	Conservation Reserve Enhancement Program (State)
CRP	Conservation Reserve Program (Federal)
CSP	Conservation Security Program
CTA	Conservation Technical Assistance
CWA	Clean Water Act
CZARA	Coastal Zone Management Act Reauthorization Amendments of 1990
DCTED, CTED	Washington State Department of Community, Trade and Economic Development
DFW, WDFW	Washington State Department of Fish and Wildlife
DNR	Washington State Department of Natural Resources
DOH, Health	Washington State Department of Health
ECY, Ecology	Washington State Department of Ecology
EPA, US EPA	US Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FFR	Forests and Fish (Report)
ESA	Endangered Species Act
FSA	Farm Services Agency
GMA	Growth Management Act
HCP	Habitat Conservation Plan
HPA	Hydraulic Project Approval
HUC	Hydraulic Unit Code
IAC	Washington State Interagency Committee for Outdoor Recreation
LLP	Landowner Landscape Plan
MOA, MOU	Memorandum of Agreement, Memorandum of Understanding
NALMS	North American Lake Management Society
NMFS	National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System

Abbreviation	Agency, Organization or Program
NPS	Nonpoint Source (pollution)
NRCS	Natural Resources Conservation Service (USDA)
NWMTA	Northwest Marine Trade Organization
OSPI	Washington Office of the Superintendent of Public Instruction
Parks	Washington State Parks & Recreation Commission
PSAT	Puget Sound Action Team
RCRA	Resource Conservation Recovery Act
SEPA	State Environmental Policy Act
SMA	Shoreline Management Act
SRA	Salmon Recovery Act
SRO	Salmon Recovery Office
TFW	Timber Fish and Wildlife (replaced by FFR – Forests and Fish)
TMDL	Total Maximum Daily Load
Tribes	Indian Tribes of Washington
USDA	US Department of Agriculture
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
UW	University of Washington
WACD	Washington Association of Conservation Districts
WALPA	Washington Lake Protection Association
WHIP	Wildlife Habitat Incentives Program
WPA	Watershed Planning Act
WRAS	Watershed Restoration Action Strategy
WRIA	Watershed Resource Inventory Area
WSDA	Washington State Department of Agriculture
WSWSDOT	Washington State Department of Transportation
WSGP, UW	Washington Sea Grant Program, University of Washington
WSU	Washington State University

Executive Summary

Even though Washington State has been working on controlling nonpoint sources of pollution for many years, it has only been in the last five that a comprehensive focused approach was developed. Prior to that, controlling point sources of pollution was a priority for the Department of Ecology and other state agencies. It was assumed that reducing polluted flows that came out of the end of a pipe would go a long way to solve our water quality problems. It did, but another source of pollution then became more obvious.

After a majority of point source discharges were controlled, Washington still suffered from water quality degradation. What were these other causes of water quality problems? They were nonpoint sources of pollution. Federal and state environmental agencies have long realized that controlling these sources requires a different approach than controlling point sources. Why? Because nonpoint pollution is inextricably tied to local land uses and individual actions.

Washington's first statewide Water Quality Plan to Control Nonpoint Source Pollution was published in April 2000. In that plan, the state obligated itself to update the nonpoint every five years by analyzing programs and progress in achieving plan results. This rewrite of the nonpoint plan recognizes the problem of trying to manage local land uses and individual actions from the state's perspective. State agencies recognize that compliance with the Clean Water Act is a mutual effort with the local jurisdictions and the public. Thus, the distinguishing characteristic of this plan is to support sustainable communities through the creation and preservation of relationships with local entities. This plan recognizes the role that local governments play in water quality improvements and the importance of public participation in understanding and addressing nonpoint pollution.

This plan does not capture every activity the state performs to address nonpoint pollution problems. For instance, it does not contain lengthy descriptions of existing programs, such as Ecology's invasive aquatic weeds program or stormwater permit program, and make recommendations about how they should proceed. Instead, the plan focuses on areas where no programs are in place or where state agency efforts can help to make a difference.

This is a Washington State Plan. Even though the Department of Ecology has the lead in writing this document, it belongs to all state agencies that have programs to control nonpoint sources of pollution. Those agencies are represented by their designated members on the State Agency Nonpoint Source Workgroup.

Finally, at the beginning of each chapter is a short quote from Aldo Leopold's Land Ethic[1]. His philosophy about the land is more relevant now than ever before. Aldo Leopold is best known as the author of *A Sand County Almanac* (1949), a volume of nature sketches and philosophical essays recognized as one of the enduring expressions of an ecological attitude toward people and the land.

Chapter 1
A Summary of Water Quality in Washington State

The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land. *Leopold, 1948*

Introduction

This introduction is a summary of Volume 1 of the nonpoint plan, which contains information for each of the 62 Water Resource Inventory Areas (WRIAs) of Washington State. The purpose of this summary is to identify statewide problem areas and to identify the reasons for water quality problems.

The summary for each WRIA contains demographic information, 303(d) listed problem areas, a list of impacted designated uses, and the programs and plans in place to control nonpoint sources of pollution. Information has been compiled and synthesized into a series of problem statements describing the nonpoint pollution problems we have identified. Washington State agencies can use this information to understand the range and extent of water quality degradation, to help determine priority areas, and to develop projects and programs needed to solve those problems.

Population Growth

The most startling change in demographics is the growth in population in the last five years (see Figure 1.1). The largest change from 1990 to 2004 is the growth of urban areas.

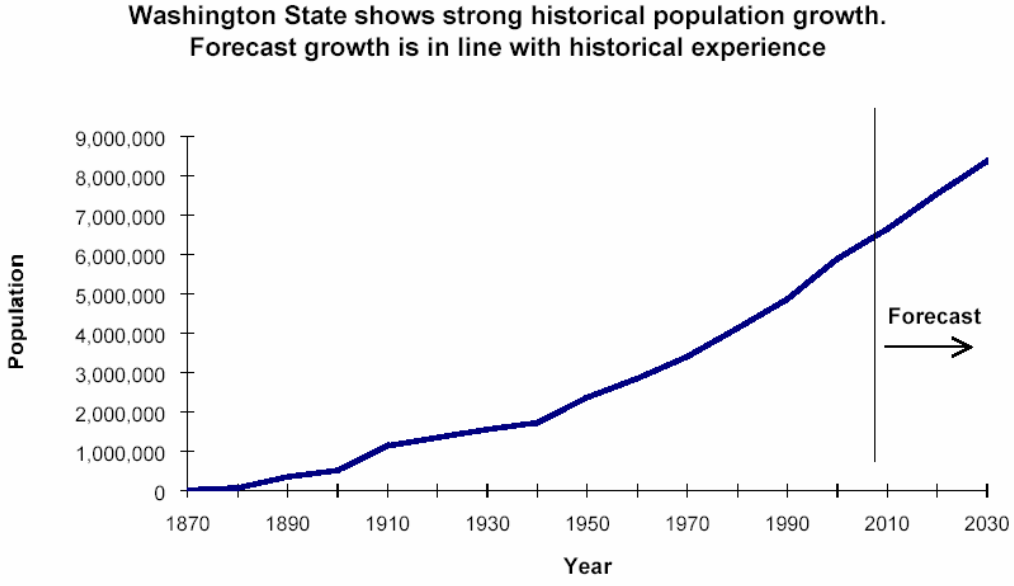


Figure 1.1
Washington State Population Trend[2]

There are three areas in Washington that are exhibiting large population growth (Figure 1.2).

- Communities along the I-5 corridor through the Puget Sound area and south into the Vancouver area.
- Along I-82, from Yakima into the Tri-cities.
- The Spokane area.

Other areas are also exhibiting strong population growth, but do not have as large a growth factor as these three areas. During the 1990s, an average of about 130,000 people moved into the state each year. That, combined with increased birth rate, forced an increase in construction and development. Most of this growth originally centered in urban districts associated with metropolitan Puget Sound, the I-5 Corridor, the I-82 corridor, and the Spokane area. More recently, however, growth has spread throughout the state, with rates ranging from 0.3 percent annual growth in the rural southeastern part of the state, to 5 percent growth in Clark County. The growth in Clark County is more than double the statewide rate of 2.3 percent.

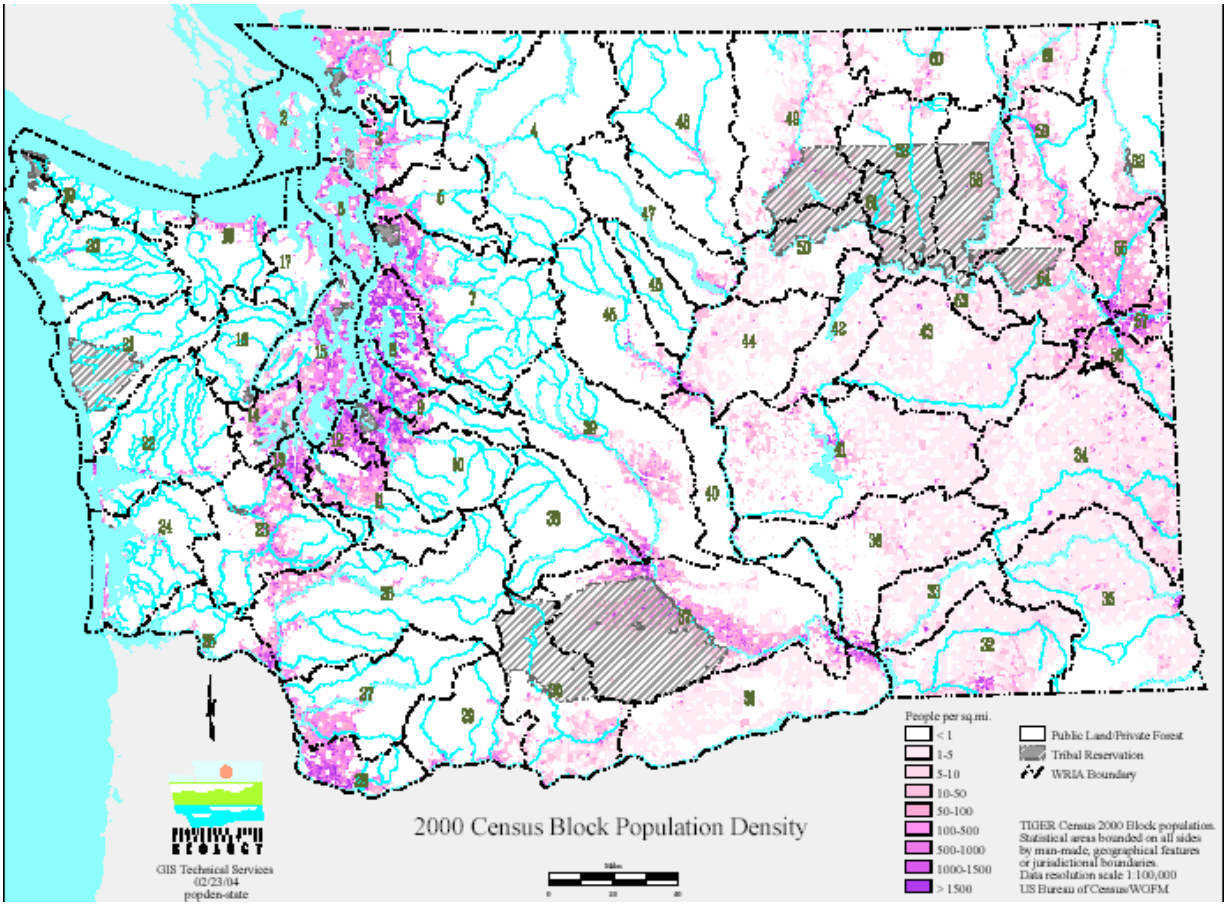


Figure 1.2
2000 Census Block Population Density of Washington State[3]

What does population growth have to do with nonpoint source pollution? Simply stated, a major factor is the increase of impervious surfaces associated with increases in housing, roads, and business areas. When pavement, roofs, and other hard surfaces replace forests, meadows, and other natural areas they generate stormwater runoff. Stormwater runoff picks up oils, grease, metals, yard and garden chemicals, dirt, bacteria, nutrients, and other pollutants from paved areas, and carries them to streams, rivers, wetlands, and other water bodies.

The current *State of the Sound Report, 2004*, documented the increase in impervious surfaces within the Puget Sound Region. The following table shows land cover changes from 1991-1999.

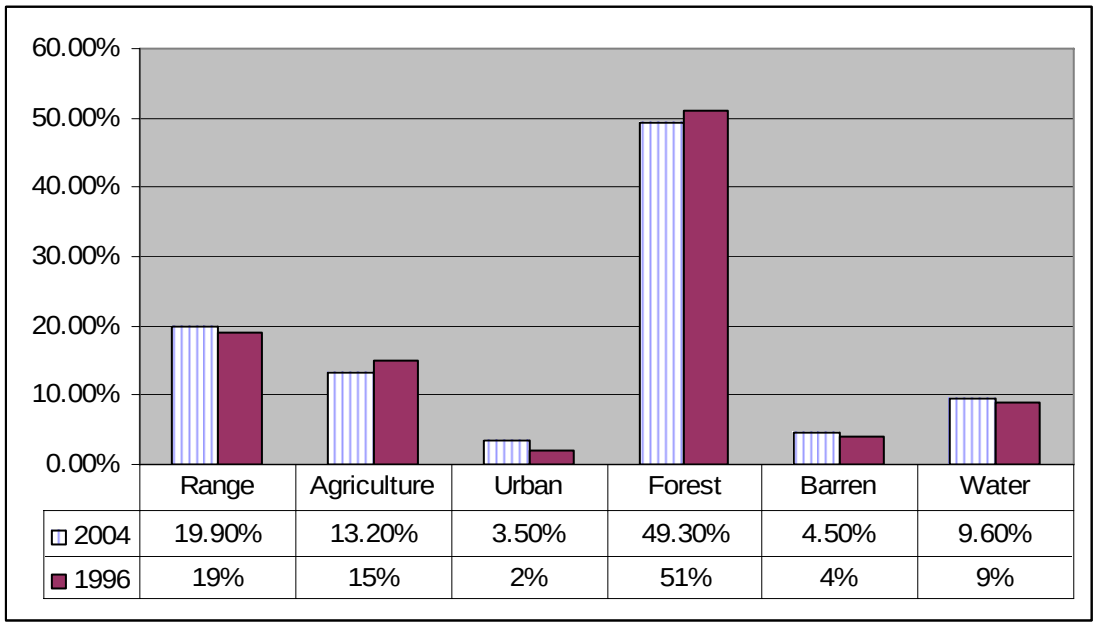
Table 1.1
Land cover changes from 1991 - 1999

Land Cover Type	Percent Change in Land Cover 1991-1999	Change in Square Miles
High level of development 75% or more area covered with parking lots, streets, roof tops	6.3% increase	10 miles^2
Low-to-medium development Between 15 and 75% covered with hard surfaces	7.9% increase	63 miles^2
Forest Cover	8.5% decrease	-241 miles^2

Land Use and Nonpoint Source Pollution

Nonpoint pollutants are introduced into water through runoff. Rainfall and snow melt wash pollutants from the land into rivers, streams, lakes, oceans, and underground aquifers. Land use is strongly correlated to nonpoint pollution. Therefore, to manage nonpoint pollution, we must focus on land use activities.

The intensity of environmental impact from each land use differs. For example, urban districts, making up about 3.5 percent of the land base, are generally under the highest environmental stress. On the other hand, park areas, with far more land area in the state, cause minor environmental impact. Agricultural and forestry land uses account for approximately 63 percent of land in the state, which may give an initial impression that the state has large land areas that do not contribute much pollution (Figure 1.3).



	Range	Agriculture	Urban	Forest	Barren	Water
2004	19.90%	13.20%	3.50%	49.30%	4.50%	9.60%
1996	19%	15%	2%	51%	4%	9%

Figure 1.3
Land Use Changes in Washington State

However, nonpoint source problems associated with land uses vary from none to very extensive, depending upon location and control programs in place. It is interesting to note that the land use that covers the smallest land area (urban areas) may pose the greatest threat to surface water quality by means of stormwater runoff.

The major sources of nonpoint pollution can be divided into the following categories.

Categories	**Associated Land Uses**
Agriculture	Livestock keeping; dryland and irrigated crops; grazing; non-commercial agriculture
Forest Practices	Road construction and maintenance; harvesting; chemical applications.
Urban/Suburban Growth	Stormwater runoff; on-site sewage systems; hazardous materials; construction and maintenance of roads and bridges; residential use of fertilizers and pesticides.
Habitat Alteration	Filling of wetlands and alteration of riparian areas; shoreline development, stream channelization, dikes, dredging, riprap, and dams.
Recreation	Marinas and boats, off-road vehicles.

What is the Quality of Washington State's Water?

Water Quality Assessment

According to the draft 2004 Water Quality Assessment, the most common water pollution problems in Washington are high temperature, fecal bacteria, pH, low dissolved oxygen, metals, and nutrients. Most of these problems are caused by nonpoint source pollution, which is the primary source of pollution in rivers, lakes, and ground water. Although the state has fewer monitoring programs focused on toxic pollutants, we suspect that they are also a problem.

Ecology's primary means of reporting on the status of water quality is through the development of an integrated water quality monitoring and assessment report, based on EPA's *2002 Integrated Water Quality Monitoring and Assessment Report Guidance* (November 2001). *Washington State's Water Quality Assessment* satisfies Clean Water Act requirements for both Section 305(b) water quality reports and Section 303(d) lists. Ecology's Water Quality Program has adopted Policy 1-11 that describes the methods used for assessing information to evaluate attainment of water quality standards. The policy includes criteria for compiling, analyzing, and integrating data on ambient conditions with project implementation information. The policy describes how the state integrates data from numerous sources, collected for a variety of purposes under a variety of quality control practices. *Washington State's Water Quality Assessment* places waterbody segments into one of five categories. All waters in Washington (except on reservation lands) fall into one of the five categories, which describe the status of water, from clean to polluted. *Washington State's Water Quality Assessment* may be found on Ecology's website[4] **at http://www.ecy.wa.gov/programs/wq/303d/2002/2002-index.html**

The typical pollutants from nonpoint sources and their relative frequency of detection in Washington are shown in Figure 1.4. It should be noted that the water quality assessment is not a full accounting of the water quality problems in Washington. There are still many water bodies that have not yet been monitored.

The assessment helps us to use state resources more efficiently by focusing our limited time on water bodies that need the most work and to address the problem pollutants that show up most often. The list of water bodies in the assessment reflects local government, community, and citizen recognition of water quality problems in Washington - demonstrating citizen interest in, and commitment to, clean water. Some of the water quality data used to assemble the list was submitted by local governments and citizen groups. When citizens are involved in the process of assessing water quality, they often want to be involved in actions to improve it.

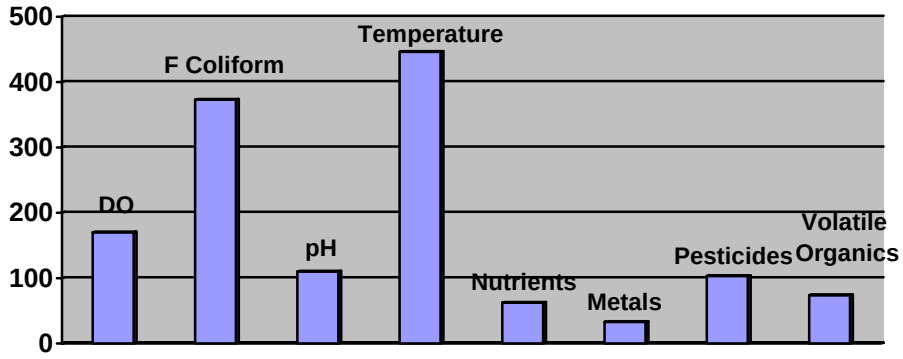


Figure 1.4
Numbers of Listings for Nonpoint Pollutants, 2004

Although not listed in the chart as commonly found pollutants, toxics are an issue here in Washington. Contaminants of increasing concern include polychlorinated biphenyls (PCBs), chlorinated pesticides, polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo-p-furans (PCDD/Fs), and mercury. The accumulation of these chemicals can result in various health effects on humans and wildlife such as reproductive abnormalities, neurological problems, and behavioral changes. Many of these contaminants in our environment are classified persistent, bioaccumulative, and toxic compounds (PBTs). This means that they last a long time in the environment, tend to accumulate in the tissues of living organisms, and can cause diseases or other disorders in humans, animals, or plants. In the 2004 legislative session, Ecology was directed to establish, through rule, specific criteria for use in identifying PBTs that pose human health or environmental impacts in Washington, and a clear process for developing chemical action plans to address those impacts. The draft rule has been released for public comment, and the rule is expected to be final in fall of 2005. For more information on the draft rule and Ecology's other work on toxic pollutants, please see the Ecology PBT strategy website at http://www.ecy.wa.gov/programs/eap/pbt/pbtfaq.html

Ecology's Water Quality Index

Ecology's stream monitoring Water Quality Index (WQI) attempts to answer non-technical questions about water quality by creating a long-term trend analysis at a regional scale. The index represents both point and nonpoint sources of pollution. It is a unitless number ranging from one to one hundred; a higher number indicates better than expected water quality. In general, stations scoring 80 and above met expectations for water quality and are of "lowest concern," scores 40 to 80 indicate "marginal concern," and water quality at stations with scores below 40 did not meet expectations and are of "highest concern." The WQI may not be consistent with Ecology's 303(d) listing because the WQI and the 303(d) analyses use different data sources, assess different pollutants, occur during different time periods, and use different evaluation techniques. The WQI does not cover every waterbody and focuses primarily on conventional pollutants.

Ecology's water quality index can be found at
http://www.ecy.wa.gov/programs/eap/fw_riv/docs/WQIOverview.html

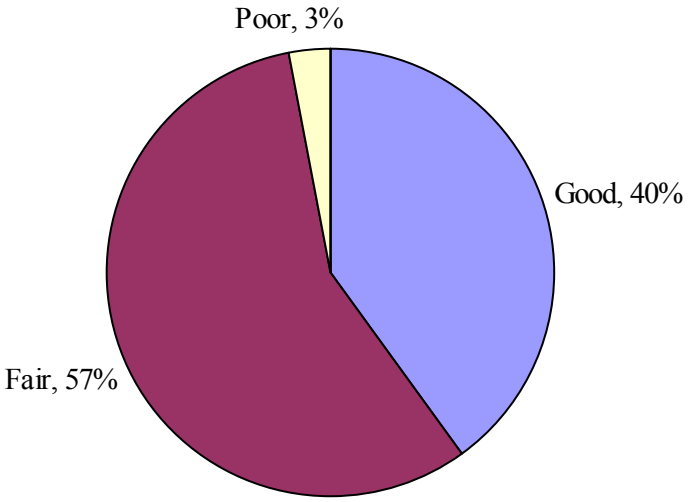


Figure 1.5
Water Quality Index Status of Washington State Waters

Chapter 2
The Nonpoint Problem

A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise. *Leopold, 1948*

Chapter 1 summarized demographic and environmental information from *Volume 1of the nonpoint plan–Water Quality Summaries of Watersheds of Washington State*[5]. The summary showed obvious problems associated with the causes and control programs for nonpoint source pollution. When Washington's first nonpoint plan was written in 1990, equal emphasis was placed on all the potential sources of nonpoint pollution: agriculture, forestry, urban areas, recreation, and loss of aquatic ecosystems (including hydromodification). However, after five years of program implementation, coordination of activities, biennial meetings of the state agency nonpoint workgroup, and looking at nonpoint problems with a critical eye, problem areas, some more apparent than others, have appeared.

Lessons Learned from Five Years of Implementation

Nonpoint source pollution is linked to local land uses and individual actions. In order to control water quality impairments resulting from nonpoint sources of pollution, we need to continue efforts to understand the connections that land use activities have to water quality and to make sure that citizens understand them, too. We also need to coordinate closely with local governments and other groups. This is the only way we can effectively achieve water quality improvements, create sustainable communities, and maintain the environment that benefits all of us.

From the past five years of implementing this plan, we learned that it takes time and effort to coordinate implementation activities among the various responsible entities. We learned that state and federal agencies need to work more closely with local governments to effectively implement nonpoint programs. Thus, creating, sustaining, and improving relationships among federal, state, and local entities will be a hallmark effort during this next five years.

The Way We Use the Land

The way land is used is the major contributing factor to nonpoint source pollution. The following chart shows the relative geographic area covered by the different land uses in Washington (Figure 2.1). By far the largest land use category is forestry. Forestry, as a land use, is regulated by the Forest Practices Act. The current forest practices rules, which were adopted in 2001to implement the recommendations in the *Forests and Fish Report* (FFR), provide a higher level of protection than the old rules. To ensure the rules achieve the objectives of the *Forests and Fish Report*, compliance monitoring and more technical assistance to small forest landowners are needed.

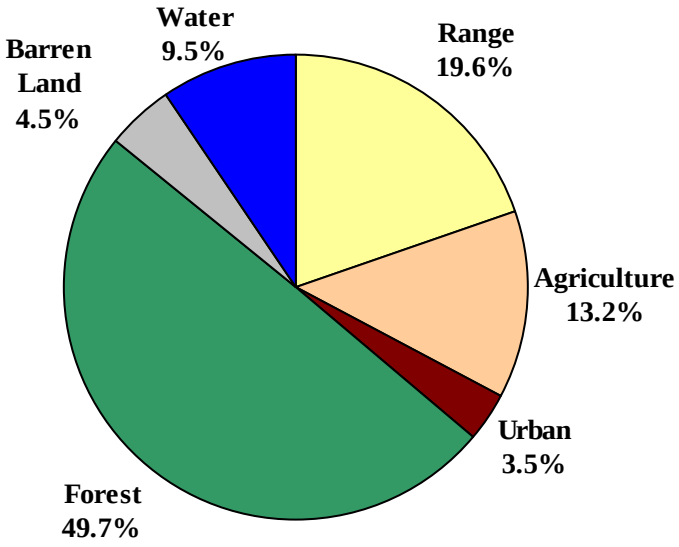


Figure 2.1
Land Use Categories

The second largest land use category is agriculture (which includes rangelands). Nutrients from dairies and other livestock operations are regulated through livestock nutrient management programs that are currently co-administered by the Washington Department(s) of Agriculture and Ecology. These programs work to protect water quality from livestock nutrient discharges through the combination of clear guidance, education, and technical assistance, as well as through coordination with related agencies, industry, and other stakeholders. However, there are no state regulations that deal systematically with other agricultural practices as there are for forest practices.

The land use that had the largest growth in the last five years is urban use. Even though it has the smallest land base, urban uses cause the greatest impacts. It has been evident for some time that urban and suburban development cause serious water quality problems Because of the increased area covered by impervious surfaces and the concentration of people whose individual actions can contribute nonpoint pollution.

There is still concern with recreational activities, especially boats and marinas, as contributors to water quality impairment, and there is concern with the loss of aquatic habitat. Intact riparian areas and wetlands are essential for treating stormwater runoff before it enters a water body. However, let us first look at how land use practices lead to water quality impairments.

The Impacts of Land Use Practices

Forest Practices

Background

Washington's forests provide abundant resource benefits, such as wood products, fish and wildlife habitat, clean air and water, opportunities for outdoor recreation, and natural beauty.

The forest products industry is the third largest industry in Washington. Over 22 million acres of private, state, and federal lands are managed for a myriad of objectives, including commercial timber production. The following chart shows the diversity of forestland ownership in Washington State (Figure 2.2).

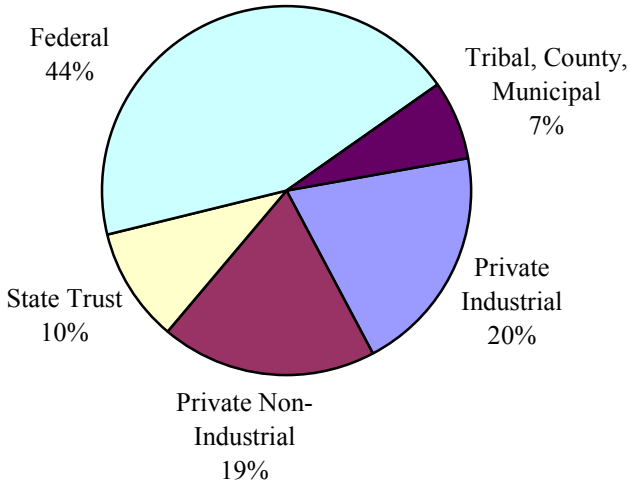


Figure 2.2
Forest Land Ownership in Washington State

Source: Washington Forest Protection Association, FYI, 2003[6]

Many land management strategies address the challenges of protecting water quality and maintaining aquatic species on forest lands. Plans that benefit fish habitat and water quality in Washington include large, multi-state federal forest management plans, state and private landowner habitat conservation plans, recovery plans being developed through the coordinated efforts of regional organizations, growth management and local watershed planning, and individual conservation and management efforts. These conservation plans and protection strategies continue to improve salmon habitat and water quality and put listed species—including salmonids, wildlife, and plants—on a positive path toward recovery in Washington. The management, conservation, and preservation strategies work together to protect and enhance natural resources and also to help conserve the forestland base and prevent its conversion to non-forest uses.

Forest Practices Rules

Since 1974, the state has regulated forestry activities on state and private lands through the Washington Forest Practices Act (chapter 76.09 RCW) and the associated forest practices rules (Title 222 WAC). The forest practices rules are implemented primarily by the state Department of Natural Resources (DNR). The rules regulate practices related to growing, harvesting, or processing timber, including road construction and maintenance, thinning, salvage, harvesting,

reforestation, brush control, and use of fertilizers or pesticides. All of these forest practices have the potential to affect water quality. The rules contain an array of best management practices designed to protect water quality, provide fish and wildlife habitat, protect capital improvements, and ensure that harvested areas are reforested.

Ecology's Role in Rule Adoption and Enforcement

Ecology has a unique role in the adoption and implementation of the forest practices rules because the Washington State Forest Practices Act and rules were designed and adopted, in part, to meet the requirements of the Clean Water Act and the state water quality standards. The Forest Practices Board is the agency responsible for adopting the forest practices rules. However, for those sections of the rules pertaining to water quality protection, the board must reach agreement with the director of Ecology, or the director's designee on the board (RCW 76.09.040(1)(e)). The director's (or designee's) membership on the Forest Practices Board also gives the agency a role in adopting other forest practices rules. In addition:

1. Ecology's Water Quality Program staff collaborates with DNR and other cooperating agencies and organizations to develop forest practices rules and Forest Practices Board Manual guidelines related to water quality protection.

2. Ecology staff participates in forest practices application and notification review by providing DNR with technical input and recommendations for avoiding and/or mitigating water quality impacts associated with individual forest practices.

3. Ecology is involved in the adaptive management program at all levels, including the Cooperative Monitoring, Evaluation, and Research (CMER) Committee; Forests and Fish Policy; and the Forest Practices Board.

While DNR implements and enforces the Forest Practices Rules, Ecology also has enforcement authority related to forest practices. If Ecology determines that a forest landowner or operator has failed to comply with forest practices rules related to water quality, the agency can initiate an enforcement action if DNR does not. However, Ecology may not impose civil or criminal penalties for actions conducted pursuant to a DNR approval or directive. Ecology must notify DNR prior to taking action under statutes or rules related to water quality. Ecology may also appeal an approval of a forest practice to the Forest Practices Appeals Board.

Forests and Fish Report and the Forest Practices Rules

The Forest Practices Act has not changed substantially since its inception, but the Forest Practices Rules have undergone numerous changes over the years to protect public resources. The most recent major revision in 2001 resulted from a negotiated agreement known as the *Forests and Fish Report* (FFR). Since 1997, several species of Pacific salmon have been listed under the federal Endangered Species Act. A growing number of streams were also listed as "water quality impaired" under the federal Clean Water Act. In response, stakeholder groups, including federal agencies, state agencies, treaty tribes, counties, and small and large private forest landowners, jointly produced a science-based plan (FFR) for protecting water quality, fish habitat, and seven riparian dependent amphibians on state and private forestland in Washington.

The Forests and Fish Report was signed into state law in 1999. As a result, based on FFR findings, new forest practices rules - effective in 2001 - were designed to improve water quality and habitat for aquatic species, including native salmon, and to maintain a viable and responsible forest products industry in Washington. New rules were adopted and guidelines developed to:

- Protect steam banks from erosion.
- Ensure fish passage to upstream habitat.
- Minimize the construction of new roads and ensure that roads being used meet upgraded standards.
- Require landowners to prepare and implement Road Maintenance and Abandonment Plans (RMAPS) designed to address road related impacts. While some landowners are exempt from the planning requirement, all must comply with forest practice rules for road construction and maintenance.
- Establish mature, conifer-dominated riparian forests to provide adequate shade to streams and recruit wood to streams.
- Establish an adaptive management and monitoring program.

The Forest Practices Rules, consistent with the *Forests and Fish Report*, contain an array of best management practices believed to be most effective in protecting and improving water quality and habitat for threatened and endangered species while maintaining a viable forest products industry. The rules also contain a robust adaptive management program. The rules, in combination with the adaptive management program, provide a pathway to achieve compliance with the state water quality standards and the Clean Water Act.

The forest practices program and the forest practices rules are described more fully in Volume 2 of *Washington's Water Quality Management Plan to Control Nonpoint Source Pollution.* Compliance with the forest practices rules comprises the state's primary strategy for addressing nonpoint pollution caused by forest practices. In addition, the following plans further assure that forest practices are intended to meet both Clean Water Act (CWA) and Endangered Species Act (ESA) requirements.

Forest Practices Habitat Conservation Plan

As a result of the Forests and Fish Report, the Department of Natural Resources, on behalf of the state of Washington, is now actively engaged in a collaborative process with the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration – Fisheries (collectively known as the Services) to obtain assurances that

these ground breaking rules comply with the Endangered Species Act. The state is seeking an incidental take permit from the Services for a period of fifty years through the implementation of a plan known as the Forest Practices Habitat Conservation Plan (FPHCP).

Given the geographic scope of lands covered by the FPHCP and the associated Forest Practice Act and rules (approximately 9.1 million acres of forestland in Washington), the large number of landowners involved, and the multiple species for which coverage is being sought, the state has developed the FPHCP as a programmatic plan. Whereas most habitat conservation plans approved to date are agreements between the federal government and an individual landowner, the programmatic nature of the FPHCP provides ESA coverage for forest landowners through the state's forest practices program.

Forest practices activities covered by the FPHCP include road and skid trail construction, road maintenance and abandonment, final and intermediate harvesting, pre-commercial thinning, reforestation, salvage of trees, and brush control. Adaptive management research and monitoring activities are also covered by the plan. The FPHCP includes protection measures to monitor, minimize, and mitigate any impacts caused by these activities.

DNR State Trust Land Habitat Conservation Plan (HCP)

Approximately 2.1 million acres of state-owned forestlands (State Trust) are managed by the Department of Natural Resources. In accordance with the state constitution, timber harvest from these lands is a major source of revenue for public school construction, county government, universities, prisons, and other state institutions. Management of this highly productive forestland has generated over $250 million annually over the last two years for the trust beneficiaries.

The DNR State Lands HCP covers approximately 1.6 million acres of state trust land. It includes all of the state trust forest lands in western Washington, as well as trust lands within the range of the spotted owl on the east slope of the Cascade Range. The plan provides protection for salmon, aquatic species, the marbled murrelet, and a number of other wildlife species on the west side of the cascades, for the northern spotted owl throughout its range, and for other upland wildlife species.

Private and Local Government Habitat Conservation Plans

Several private timber companies and two municipalities have completed habitat conservation plans that protect aquatic species and riparian habitat on approximately 600,000 acres of forestland. Only the Simpson HCP has been provided with CWA assurances through a TMDL.

Water Quality Impacts from Forest Practices

Forest practices can affect the quantity and quality of aquatic and riparian habitat by altering physical watershed processes such as erosion, large wood recruitment, and availability of shade. Timber harvesting, road construction and maintenance, and the use of pesticides have the greatest potential for affecting the character of riparian and in-stream habitat as well as impacting water quality. Other forest practices activities may also have adverse effects.

The types of forest practices activities that can cause water quality problems are:

Road Construction and Maintenance
The fine sediment in the surface runoff from forest roads can impact spawning gravels and egg survival, and fill pools needed for rearing. Coarse and fine sediments entering small headwater channels are routed to downstream depositional reaches where they can affect lower mainstem fish species such as chinook, chum, steelhead, and coho.

Poorly designed, constructed, or maintained forest roads can also divert surface water from one drainage to another, harming the hydrology of the natural stream system. Improperly maintained ditches that direct surface water to streams, blocked culverts, or inadequate road surfacing can all contribute to increased sedimentation. If conducted on steep or unstable slopes, these practices can accelerate the rate of mass wasting processes such as debris avalanches, debris flow, and debris torrents .Movements of large amounts of sediment and debris through a stream can cause extensive physical damage, including streambank erosion and degrading habitat by changing the channel morphology—causing a stream to widen and become shallower and susceptible to higher temperatures.

Timber Harvest
Timber harvest, particularly within riparian areas, can affect streambank and floodplain integrity. Riparian vegetation slows water velocity on the floodplain and the roots inhibit erosion along stream banks, reducing sediment deposition in streams.

Riparian areas are an important source of large woody debris (LWD) that enters, or is recruited to the stream channel. Large wood is an important component of fish habitat. It forms pools, provides cover, supplies spawning gravels, and creates channel complexity—all important to fish rearing and survival. Large wood recruitment originates from a variety of processes including tree mortality, windthrow, undercutting of stream banks, debris avalanches, and deep-seated mass soil movements. Timber harvest or removal of trees for road construction can result in a deficiency of large wood available to streams.

Timber harvest and disturbance to understory vegetation can have the greatest effect on direct solar radiation by reducing the amount of available streamside shade. Reductions in streamside shading are most likely to adversely affect water temperature and the habitats of aquatic species. Removal of riparian vegetation can also affect the amount of leaf and needle litter, which are important to aquatic food chains and nutrient cycling.

Use of Pesticides
Pesticides used in forest management can become water contaminants if they are transported to surface waters or ground water. Transportation to surface waters would most likely occur through wind drift; however, heavy rains can result in pesticide transport in stormwater runoff or through contaminated soil erosion. Pesticides can also enter surface waters by overspray and spills.

Impacts on Designated Uses

If forest practices are conducted improperly, the result can be increased water temperatures, sediment delivery to streams, damage to stream hydrology, loss of large wood in streams, and delivery of pesticides and fertilizers to surface waters. All of these problems were documented in 303(d) lists and 305(b) water quality assessments in the 1990s.

Impacted Designated Uses from Forest Practices

- [x] Recreation
- [x] Water Supply
- [x] Shellfish Harvesting
- [x] Aquatic life
- [x] Wildlife habitat
- [x] Boating
- [x] Commerce and navigation
- [x] Aesthetics

Agriculture

Background

For the purposes of this document, agriculture is defined as the production of crops or livestock for commercial sale and/or personal benefit. Agriculture in Washington is a diverse industry that encompasses a wide range of activities and products; it includes large commercial operations that cultivate and harvest thousands of acres of crops and small farms that raise and sell dairy heifers (Figure 2.3). Agricultural products are distributed through industrial market systems, as well as through local cooperatives, farmers' markets, or private contacts. Agricultural activities in Washington represent a significant sector of the state's economy, with contributions that total about 20 percent of the gross state product at the retail level. It is also a highly diverse business, with more than 250 different crops grown in Washington . Some crops grown here, such as spearmint, represent most of the national and, in a few cases, international market.

Plant-based agriculture in Washington includes cut flowers, bulbs, vegetables, fruits, nursery and landscaping stock, berries, orchards, vineyards, pasture grass for forage, corn or other grains, and hay for silage. Commercial livestock operations in Washington include bovine dairies,

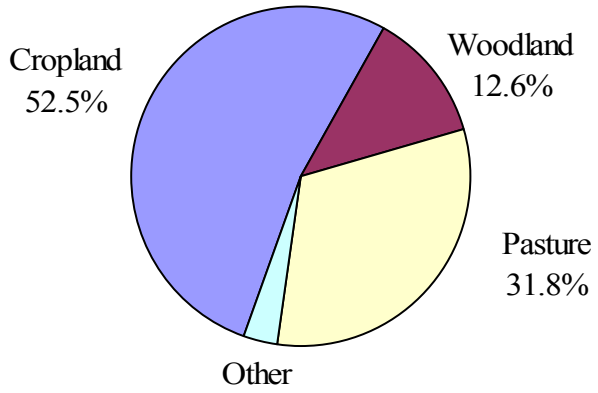


Figure 2.3
Agricultural Land Use 2002
2002 Census of Agriculture, USDA National Agricultural Statistics Service, June 2004.

cattle feedlots, and sheep, poultry and swine operations. In addition, livestock operations can also include the breeding and keeping of horses, dairy goats, geese/ducks, rabbits, and exotic animals such as llamas, emus, and ostriches (Figure 2.4). Livestock grown strictly for personal use also comprises a significant portion of the total livestock numbers in the state**.**

One type of agricultural operation is considered a point source of pollution. These are businesses that meet the definition of a Concentrated Animal Feeding Operation (CAFO). These are regulated under the National Pollutant Discharge Elimination System (NPDES) program. This program requires CAFO operators to obtain a permit if they have a discharge to state waters. At this time, the permit for Washington is still under development. The important thing to remember is that whether an agricultural operation is considered a point or a nonpoint source, discharges to state waters are not allowed without a NPDES permit.

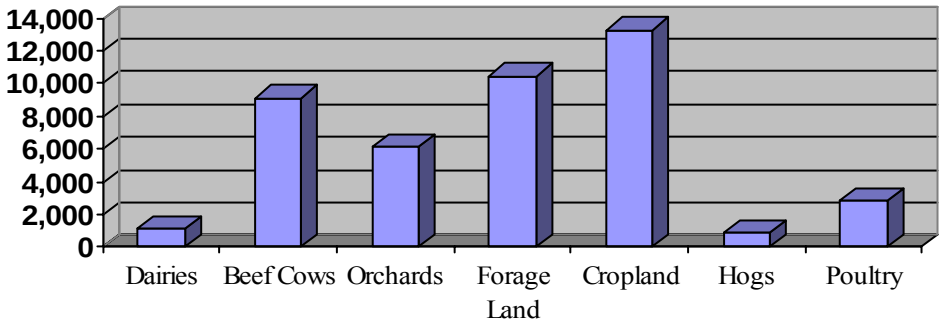


Figure 2.4
Number of Farms in 2002
2002 Census of Agriculture, USDA National Agricultural Statistics Service, June 20047

Water Quality Impacts from Agriculture
Nationwide, agricultural activities are a leading cause of impaired waters. Most of the degradation is attributed to loss of riparian corridors. The results are increased fecal coliform

contamination, high temperature, and excessive nutrients. The most common agricultural activities leading to impairment are those associated with livestock access to riparian areas. Those activities lead to fecal coliform bacteria from manure, increased sedimentation, and loss of trees in riparian areas that result in increased surface water temperatures. In addition to degradation of surface waters, agriculture activities can cause groundwater pollution when fertilizers (manure or synthetic) and pesticides (herbicides, insecticides, and fungicides) are improperly applied to fields and other cropland.

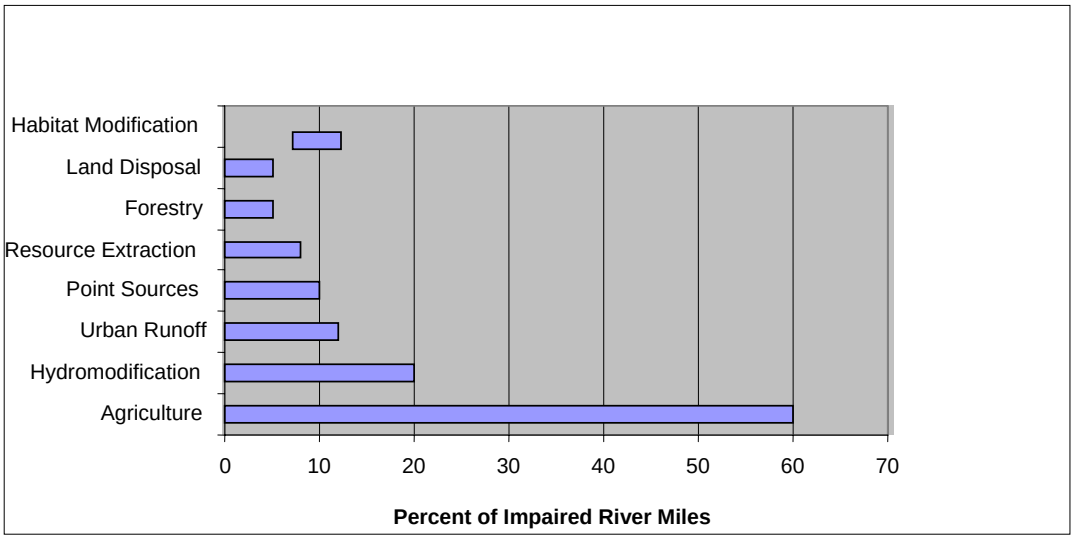


Figure 2.5
Leading sources of river and stream impairment
National Water Quality Inventory, 1998 Report to Congress. June 2000 EPA841-R-00-001

Irrigated agriculture practices can contribute to surface water quality degradation. Two basins, the Yakima and the Columbia, support the majority of the state's irrigated agriculture production. That is, of the 1.8 million total acres of irrigated land in Washington, 575,000 acres are located in the Columbia Basin, while the Yakima Basin supports 520,000 acres. The remaining 700,000 acres are distributed throughout the state. Soil loss caused by the application of irrigation water has decreased over the past 20 years, due to improved practices, although significant erosion still occurs. Erosion of sediments causes water quality problems by degrading fish habitat and decreasing water clarity. Irrigation return flows draining agricultural areas can carry pesticides and fertilizers to rivers and streams. Irrigation also increases the potential for leached materials, such as pesticides and fertilizers, to reach ground water.

Grazing and rangeland management activities also create a significant potential for water pollution, particularly in eastern Washington. Cultivating crops and grazing livestock too close to stream banks can cause increased erosion rates, increased temperature, and other water quality problems.

Ambient monitoring has shown that impairment to water quality exists in Washington's dry-land agricultural areas, particularly where soils erode easily, such as in the Palouse region. Stream corridors associated with agricultural and forested lands are especially susceptible to degradation of water quality due to pressures from animals foraging and drinking near or within waterways. Other detrimental activities include improper management of manure and wastewater confinement area runoff, excess surface runoff from overgrazed pastures, trampling of streamside vegetation, and direct access to streams by animals. Effects on surface and ground water quality from these types of activities can include high levels of fecal contamination, increased nutrient loads, and sedimentation.

Wind blown dust from poor farming practices can impact water quality. Pollution from the air may settle into streams, lakes, or estuaries. Once pollutants become airborne, they may fall to the ground in a process called *atmospheric deposition*. The deposition of an *air pollutant* on land or water can take several forms. *Wet deposition* occurs when *air pollutants* fall with rain, snow, or fog. *Dry deposition* is the deposition of pollutants as dry particles or gases. The pollutants can reach bodies of water as *direct deposition* falling directly into the water, or as *indirect deposition*, falling onto land and washing into a body of water as runoff. There is also some evidence that atmospheric pollutants can affect groundwater.

Both point and nonpoint sources of water pollution from livestock are controlled through permitting processes, implementation of BMPs, and the implementation of educational and outreach efforts. For example, CAFOs must follow rules and guidelines outlined in the NPDES permit. Nutrients from dairies and other livestock operations are regulated through livestock nutrient management programs that are currently co-administered by the Washington Department(s) of Agriculture and Ecology. These programs work to protect water quality from livestock nutrient discharges through the combination of clear guidance, education, and technical assistance, as well as through coordination with related agencies, industry, and other stakeholders.

Impacts on Designated Uses

Designated uses that are threatened or impaired in Washington due to diffuse agricultural sources of pollution include drinking water supply, shellfish harvesting, aquatic life, wildlife habitat, and aesthetics. The original 1989 assessment of nonpoint sources of pollution for Washington State determined that agriculture (and particularly animal keeping) is one of the main sources of water quality degradation to creeks and rivers. That assessment has not changed. The 1998 305(b) assessment also reported that nearly half the river miles assessed were negatively impacted by activities associated with farm animals, such as runoff from pastures and holding areas, and destruction of riparian vegetation.

Impacted Designated Uses from Agriculture

- [x] Recreation
- [x] Water Supply
- [x] Shellfish Harvesting
- [x] Aquatic life

- [x] Wildlife habitat
- [ ] Boating
- [ ] Commerce and navigation
- [x] Aesthetics

Urban/Suburban Growth

Background

The sources of nonpoint pollution in the urban/suburban category include on-site sewage disposal systems, stormwater runoff, fertilizers, and household wastes, and all of these are magnified by increasing urban and suburban development.

Natural vegetative cover once protected much of Washington's land by intercepting rainfall, reducing erosion, and recharging ground water. The trees and shrubs held much of the moisture, and the forest duff layer absorbed runoff, releasing it slowly and steadily to the streams. However, with the advent of human development patterns, some hydrologic regimes have been forever altered.

One of the major problems currently facing Washington is the high growth rate the state experienced in the 1990s, and continuing into the 2000s. During the 1990s, an average of about 130,000 people moved into the state each year. That, combined with the birth rate, forced an increase in construction and development and thus a change in land cover. Most of this growth originally centered in urban districts associated with metropolitan Puget Sound. More recently, however, growth has spread throughout the state, with rates ranging from 0.3 percent annual growth in the rural southeastern part of the state, to 5 percent growth in Clark County.

During this period, local governments and citizens have focused much effort on maintaining the quality of life in their communities. For example, in 1991, only 14 of the state's 39 counties were fully planning under the Growth Management Act. By 1998, 29 counties, or almost twice that number, were fully planning, utilizing comprehensive plans and development regulations. These 29 counties hold more than 95 percent of the state's population. All ten of the counties not fully planning under the act have growth rates lower than the state average and plan under the Washington State Planning Enabling Act (RCW 36.70). The Growth Management Act requires the use of best available science (BAS) to protect the functions and values of critical areas. Ten counties and their cities are planning for resource lands and critical areas only. Nearly all local governments required to prepare comprehensive plans have completed their first plans under the act and are beginning to see initial results.

On-site sewage systems serve approximately 1.4 million people in the 39 Washington counties. Most of the administration of on-site septic system regulations and programs is conducted by the 32 local health jurisdictions. The state recognizes that proper operation and maintenance of on-site systems is essential to ensure they function properly. WAC 246-272-15501 (2)(b)(ii)

describes the operation and maintenance responsibilities of the on-site system owner and of the local health district. The owner is responsible to properly monitor the operation of their system, to have it pumped when necessary, to avoid damage or improper use of the system, and to ensure that the flow of sewage does not exceed the approved design in both quantity and waste strength.

Land clearing for buildings, parking lots, and landscaped areas is now occurring at a rapid rate. Soils that allowed water to infiltrate are being paved over. With increased impervious surfaces, rainfall runs quickly and directly into streams, dramatically increasing volume and peak flows. In addition, development encroachment into riparian corridors and modifications to the surface water drainage network all work together to increase runoff and pollution. Stormwater runoff may contain high concentrations of heavy metals, fecal coliform, silt, petroleum products, nutrients, and pesticides.

Sprawl is unmanaged development marked by automobile-dependent, spread-out suburbs, where the activities of daily life – home, school, shopping and work – are separated by long distances linked only by pavement. It results in the excessive transformation of natural areas to hard surfaces, such as ever-widening roads, parking lots, and roofs. In effect, sprawl development intensifies the effects of urbanization because it results in a greater area of impervious surface per person. More concentrated development patterns, as envisioned in the GMA, may reduce impacts, but only if we preserve portions of every watershed in an undeveloped condition. Concentrating development alone will not protect water quality.

Many stormwater managers, developers, engineers, and local governments in Washington are beginning to use low impact development (LID) practices to manage stormwater on-site. Low impact development (LID) is an innovative stormwater management approach with a basic principle that is modeled after nature—manage rainfall at the source using uniformly distributed decentralized micro-scale controls. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and retain runoff close to its source.

The interagency Puget Sound Action Team, Ecology stormwater staff, university scientists, and others are supporting demonstration projects, conducting research, and education. Ecology is currently revising its *Stormwater Management Manual for Western Washington* to incorporate flow control credits for additional LID practices such as permeable pavement and bioretention.

The Puget Sound Action Team, using 319 funding from Ecology, has published a Puget Sound Technical Manual for Low Impact Development, which may be found at http://www.psat.wa.gov/Publications/LID_tech_manual05/lid_index.htm. This approach offers promising techniques that will improve water quality and hydrologic responses.

In 1987, Congress changed the federal Clean Water Act by declaring the discharge of stormwater (traditionally considered a nonpoint source) from certain industries and municipalities to be a point source of pollution, requiring National Pollutant Discharge Elimination System (NPDES permits or water quality discharge permits. The EPA stormwater regulations established two

phases for the stormwater permit program. Phase I stormwater NPDES permits have been issued to cover stormwater discharges from certain industries, construction sites involving five or more acres, and municipalities with a population of more than 100,000. There are seven Phase I municipalities in Washington.

On October 29, 1999, the final Phase II stormwater regulations were signed into rule by EPA. The Phase II regulations expand the requirement for stormwater permits to all municipalities located in urbanized areas and to construction sites between one and five acres. The rule also requires an evaluation of cities outside of urbanized areas that have a population of more than 10,000 to determine if a permit is necessary for some or all of these cities. Under the new rule, over 100 additional municipalities in Washington may need municipal stormwater permits (Table 2.1).

Table 2.1
Population Covered Under Stormwater Permits

	Western WA	**Eastern WA**	**Washington State**
Total population	4,587,173	1,306,948	5,894,121
Population under Phase I	1,122,637	NA	1,122,637
Population under Phase II	2,905,960	676,264	3,582,224
Total pop. under phase I & II	4,028,597	676,264	4,704,861
% of pop. under Phase I	24%	NA	19%
% of pop. under Phase II	63%	52%	61%
Total % of pop. under permit (phase I & II)	87%	52%	80%

* all figures based on 2000 census data and actual population data within urbanized areas.

Water Quality Impacts from Urban/Suburban Sources

Numerous studies conducted during the late 1970s and 1980s showed that stormwater runoff from urban and industrial areas is a potentially significant source of pollution. Stormwater quality tends to be extremely variable. The intensity of rainfall fluctuates dramatically, affecting runoff rate, pollutant washoff rate, in-channel flow rate, pollutant transport, sediment deposition and re-suspension, and channel scour, for example. As a result, pollutant concentrations and other stormwater characteristics at a given location will vary significantly during a single storm runoff event and from event to event. In addition, the transitory and unpredictable nature of

many pollutant sources and release mechanisms (spills, leaks, dumping, construction, irrigation runoff, vehicle washing, etc.) and differences in the time interval between storm events also contribute to inter-storm variability.[8]

Based on Puget Sound area studies, watersheds that have ten percent effective impervious area, or have one-third of their forest cover removed (without any effective impervious area), have "demonstrable degradation, some aspects of which are surely irreversible."[9] Urbanization brings an increase in impervious land cover and a corresponding loss of natural vegetation. Land clearing, soil compaction, riparian corridor encroachment, and modifications to the surface water drainage network all work together to increase runoff and change watershed hydrology. Riparian zones are fragmented and stripped, no longer able to provide shade, nutrients, and large woody debris to the stream. Streamflow fluctuates widely from summer to winter, and from storm to storm. Streambank erosion brings fine sediment deposition and loss of spawning and incubating habitat.

Runoff may contain high concentrations of heavy metals, fecal bacteria, silt, petroleum products, nutrients, PAHs,, phthalates, mercury, and pesticides. In the short term, these pollutants can stress aquatic organisms, damage shellfish beds, and restrict water recreation. In the long term, accumulation of pollutants in receiving waters can create irreversible problems such as eutrophication of lakes, groundwater contamination, and contaminated sediments.

In addition to carrying pollutants, runoff can cause streambed scouring and erosion, which contribute to water quality degradation. Impermeable surfaces, such as roofs, parking lots, and paved streets, prevent rainfall from infiltrating the soil, creating sudden rushes of water in receiving streams during a storm.

Although stormwater is generally discharged to surface waters, an alternative is to discharge stormwater to underground wells. Approximately 18,000 dry wells and similar infiltration devices are used to dispose of storm water in Washington. However, such discharges can contaminate public or private water wells.

Another problem with stormwater control is infiltration and inflow (I&I) in sewer systems. As improvements are made to the sewer systems to eliminate stormwater I&I, the stormwater is typically diverted to surface waters, often without any treatment. Stormwater I&I contributes to combined sewer overflows (CSOs), which pose a serious public health threat, particularly in shellfish growing areas.

Impacted Designated Uses from Urban/Suburban pollution

- [x] Recreation
- [x] Water Supply
- [x] Shellfish Harvesting
- [x] Aquatic life

- [x] Wildlife habitat
- [x] Boating
- [x] Commerce and navigation
- [x] Aesthetics

Recreation

Background

Recreation includes activities in fresh and marine waters; on ocean beaches; along the shores of rivers, streams, and lakes; and on the waterfront of Puget Sound. More than half of all Washington residents engage in recreational activities and, of those, more than 60 percent participate in freshwater activities.[10]

Many recreational activities can have an impact on water quality or be impacted by poor water quality, including:

- Scuba/skin diving
- Water skiing
- Motor boating
- Personal watercraft
- Sail boating
- Hand power canoe/kayak/rowboat
- White water rafting
- Floating
- Wind surfing
- Surfboarding
- Swimming or wading
- Beachcombing

Perhaps the biggest threat to water quality from recreational activities is from boating. It has been estimated that 20 percent of Washington's households own at least one boat. People use boats recreationally in Puget Sound, lakes, and major rivers. Power boaters represent 90 percent of the boating public. Most boats are less than 16 feet long.

Recreational boating contributes to the state economy. Direct and indirect boating sales generated $895 million and $2.4 billion respectively in 1986 and provided jobs for an estimated 17,300 people statewide (1988 *State of the Sound* report by the Puget Sound Water Quality Authority).

Within Washington's coastal areas, there are over 450 marinas that provide approximately 37,400 wet moorage slips. Most marinas are small, providing less than 200 slips. In contrast, a small number of marinas owned by public port authorities account for a disproportionate number of wet moorage slips - 15,000. Of five marinas having over 1,000 slips, four are owned by port

authorities. Over half of the total number of marinas are located in the central Puget Sound counties of King (85), Pierce (29), Kitsap (26), and Snohomish (13). The 29 marinas located in San Juan County reflect the popularity of that part of Washington as a boater destination. Location and size of the fleet appears to be in approximate proportion to population centers.[9]

Current Washington State figures estimate that approximately 338,400 households own 440,000 recreational boats. Of this number, about 255,593, or 58 percent, are powerboats. About 72 percent of all recreational boats use a gasoline engine of some kind. Canoes and kayaks make up about 13 per cent of the fleet, with roughly 55,268 units.

Most recreational boats, about 299,000 are stored on trailers and hauled to and from launch sites behind a motor vehicle. Statewide, motor boat owners have access to approximately 911 public launch sites (IAC, 1997). This figure generally reflects the large number of boats in the size range of 16 to 26 feet that are usually transported by trailer. The figure also indicates a sizable fleet of recreational boats in both the coastal zone and central and eastern Washington. Many boats do not have onboard sanitation devices, and littering from boats is common.

Figure 2.5 lists typical recreational activities in Washington by percentage of population. For example, three percent of Washington citizens participate in equestrian activities. These numbers come from an assessment of outdoor recreation in 2002 by the IAC.

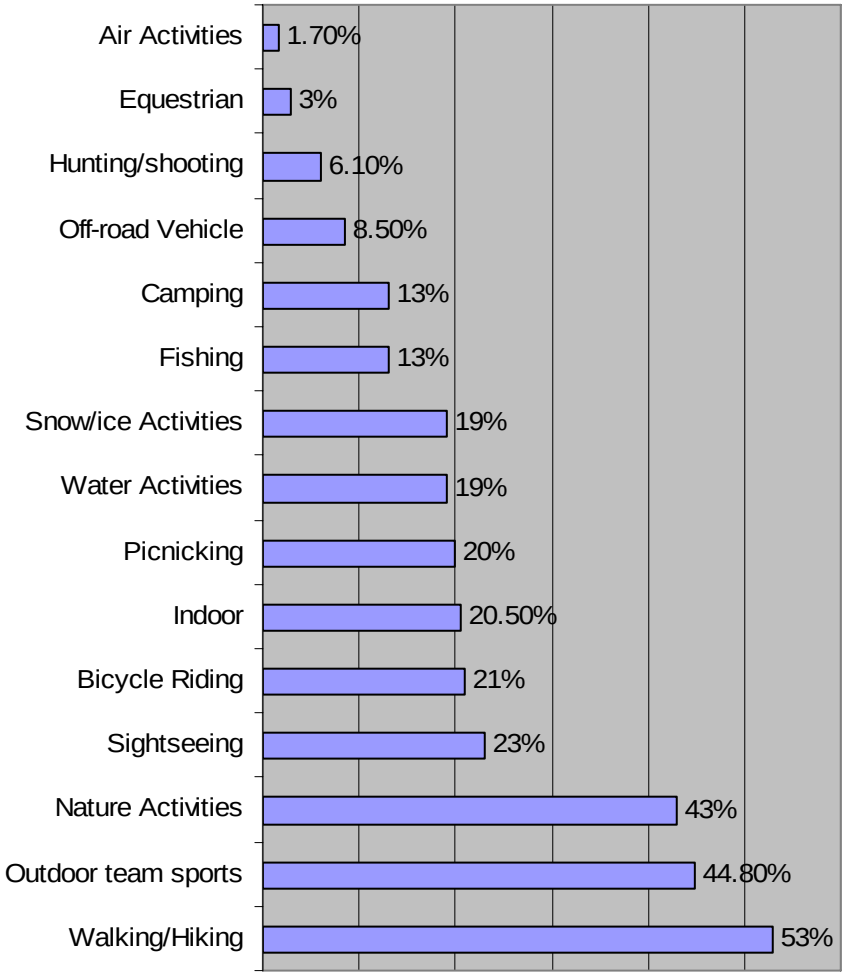


Figure 2.6
Participation in General Recreation Categories as a Percent of State Population
An Assessment of Outdoor Recreation in Washington State, IAC, Oct. 2002[11]

Water Quality Impacts from Recreational Activities
There is a high potential for water quality degradation from raw sewage, contaminated bilge water, petroleum products, trash, paint scraping, and solvents being discharged into state waters by recreational boaters. However, the magnitude of that potential in pounds of pollutants is not known.

Contaminants from marinas and recreational boating include sewage (and associated pathogens) and the toxicants contained in petroleum products and other materials used to maintain and repair boats. Discharges of treated and untreated sewage from boats may especially be a problem in smaller bays with poor water circulation, near shellfish beds and public swimming areas, and at marinas.

Since passage of the federal Clean Water Act in 1972, any boat with a toilet installed must have a marine sanitation device (MSD) to treat and/or hold sewage. Effective enforcement of this regulation by the U.S. Coast Guard, however, has proven to be a logistical impossibility. Educational programs are the most promising approach to reducing pollution from boating activities.

Contamination from recreational boats may be greatest at marinas and popular destination areas, where the concentration and disposal of wastes, including treated and untreated sewage, trash, petroleum products, and bilge water, may be significant problems. Marinas[12] themselves, if improperly designed and sited, may cause water quality problems through habitat destruction and restricted flushing. However, marinas, destination sites, and other boating facilities can provide the services that are essential for safe and effective disposal of boat wastes, particularly sewage and petroleum products. Unfortunately, many marinas do not provide sewage pump-outs or recycling facilities.

Impacted Designated Uses from Recreational Activities

- [x] Recreation
- [x] Water Supply
- [x] Shellfish Harvesting
- [x] Aquatic life
- [x] Wildlife habitat
- [x] Boating
- [x] Commerce and navigation
- [x] Aesthetics

Habitat Alteration

Background

In the 200-year period prior to the late 1980s, the state lost an estimated 31percent of its 135 million acres of wetlands.[13] Increasing population and pressure to use land more "productively" have resulted in diking, draining, and agricultural practices affecting wetlands, as well as the direct loss of wetlands[14]. There is no current data available for freshwater wetland losses in Washington. However, on the national level, the loss of wetlands has not stopped, according to a report released by the National Research Council[15]. The U.S. Environmental Protection Agency states that although wetland loss rates are slowing, the United States continues to lose approximately 70,000 to 90,000 acres of wetlands on nonfederal, rural lands each year.[16]

Wetlands provide essential habitat for feeding, nesting, cover, and breeding for birds, fish, amphibians, and reptiles. The Department of Fish and Wildlife lists over 175 wildlife species that use wetlands for primary feeding habitat and 140 species that use them for primary breeding habitat. At least one-third of Washington's threatened and endangered species require wetlands to survive.

The Puget Sound Plan[17] identified other important benefits of wetlands for human communities, including the slowing and storage of floodwater, cleansing water of certain pollutants, recharging ground water, and serving as an outlet for ground water to recharge streams (ground water discharge) and providing recreational areas. In their natural state, wetlands help decrease the need for costly stormwater facilities and flood protection measures such as levees and dikes. Continued habitat loss due to hardening of marine shorelines is still a major concern. New state shoreline guidelines to address this issue are to be produced soon.

Riparian areas are also areas of abundant biota. In addition, the riparian zone protects the adjacent stream or river. The canopy of the riparian area provides shade to cool the stream, nutrients from leaf litter, and habitat for insects and other life forms important in the aquatic food web. The riparian area also prevents or decreases erosion and sedimentation.

Wetlands and riparian areas can play a critical role in reducing nonpoint source pollution by intercepting surface runoff, subsurface flow, and certain groundwater flows. Their role in water quality improvement includes processing, removing, transforming, and storing pollutants such as sediment, nitrogen, phosphorus, and certain heavy metals. Wetlands and riparian areas buffer receiving waters from the effects of pollutants or they prevent the entry of pollutants into receiving waters.

According to EPA, three general types of habitat modification must be addressed by states as they develop their nonpoint programs.

1) Channelization and channel modification.
2) Dams.
3) Streambank and shoreline erosion.

In Washington, habitat alteration has significantly influenced the hydrology of the state. The construction of dams, tide gates, culverts, bridges, piers, and jetties, as well as the armoring of shorelines and the placement of fill, have helped create drinking water supplies, reduce flood impacts, expand road networks, improve navigation, increase drainage, prevent erosion, and reduce sediment loss. Many of these activities have also led directly or indirectly to adverse impacts on aquatic ecosystems.

Water is diverted primarily for two uses: drinking water and irrigation water. Many of Washington's older cities rely in whole or in part on surface water for drinking water supplies. In addition, numerous irrigation systems in the state use human-built side channels for water diversion and return flows.

Ecology's 1994 publication *Inventory of Dams in the State of Washington* (publication #94-16) lists 984 dams in the state that retain more than 10 acre feet of water. Only 8.8 percent of them

are for hydropower. Half are primarily for recreation and irrigation. About an equal amount are for water quality, flood control, and water supply. Most have a combination of uses. Private dams comprise the ownership of over half of the dams, followed by local government, public utility districts, federal and state ownership.

Flood control and sediment management are also important in Washington. Floods in 1990 and 1996 caused millions of dollars in damage. Many flood control structures are owned and managed by the U.S. Army Corps of Engineers. Probably the largest structure completed in recent years was the sediment retention dam on the Toutle River, following the eruption of Mount St. Helens.

Seventeen dams in Washington will begin the Federal Energy Regulatory Commission (FERC) re-licensing process in the next ten years. Many of these are large private dams on the Columbia River. Most of these dams were built 35-50 years ago. When a dam operator requests a license, Ecology works with the utility, reviews studies, analyses, and plans to make sure the facility will meet the state's water quality standards. If Ecology determines that water quality standards are attainable, a water quality certification (401 certification) is issued with conditions to ensure the standards will be met. Many of the existing dams will have difficulty meeting the standards but can do so by making operational changes.

Siltation is another important problem in Washington. Puget Sound's ports manage more than 50 million tons of cargo each year, at over 200 docks and piers. In some areas, such as the ports of Seattle and Tacoma, artificial waterways have been constructed to increase available dock space. In addition, Puget Sound is home to much of the Alaskan fishing fleet. Such traffic makes periodic dredging necessary to maintain shipping channels.

Water Quality Impacts from Loss of Aquatic Ecosystems

Damage or destruction of riparian areas is a major cause of impairment to the streams in the state. Many of these streams once hosted abundant salmon runs and other fish and wildlife. Forest practices in the upper watersheds and foothills, and development of the lowlands and valleys have caused significant sediment loads and changes in channel morphology.

The functions of wetlands and riparian areas include water quality improvement, aquatic habitat, stream shading, flood attenuation, shoreline stabilization, and ground water exchange. Wetlands and riparian areas typically occur as natural buffers between uplands and adjacent water bodies. Loss of these systems allows for a more direct contribution of nonpoint source pollution to receiving waters (USEPA, 1993).

Dams generate both point and nonpoint pollution. Dam operation and the changes that result in the water because of the dam's presence, including increased temperature and total dissolved gas, are considered nonpoint. Discharges of oil, coolants, and other wastes are considered point sources.

A major concern for Washington is the reduction in fish habitat in altered water bodies. This is especially true for anadromous fish. Stream channelization can cause streambed scouring and hardening, streambank erosion, altered waterways, and altered hydrochemistry. As a result, there are potential changes in pH, metals concentration, dissolved oxygen, instream flow, and nutrient levels.

Mitigation measures, particularly those dealing with channelization and riparian habitat, are partially addressed through wetlands programs and fish and wildlife habitat programs. One goal for Washington is to ensure that there is no net short-term or long-term loss in aquatic and riparian habitat, and to coordinate federal, state, local, and tribal fish and wildlife protection programs.

Impacted Designated Uses from Loss of Aquatic Ecosystems

- [x] Recreation
- [x] Water Supply
- [x] Shellfish Harvesting
- [x] Aquatic life
- [x] Wildlife habitat
- [x] Boating
- [x] Commerce and navigation
- [x] Aesthetics

Cumulative Sources of Pollution by Different Land Use Activities

As Table 2.2 below indicates, many sources of pollution contribute similar pollutant types. For example, fecal coliform can be contributed by agricultural practices, stormwater runoff, failing on-site sewage systems, and recreation. This can make identification of the specific source of a pollutant extremely difficult and time-consuming. The cumulative effects of these many sources of pollution can be devastating to the receiving waters and ecological systems that rely on those waters.

Table 2.2
Pollutants generated by different land uses

Nonpoint Source	Nutrients	Fecal coliform	Sediments	pH	Volatile Organics	Low Dissolved oxygen	Pesticides	Flow	Metals	Temperature
Agriculture										
Animal Feeding Operations	x	x	x	x		x				
Dryland	x		x				x			x
Irrigation	x		x	x		x	x	x		x
Noncommercial	x	x	x							x
Grazing	x	x	x	x		x				x
Forest Practices										
Road construction			x		x		x	x	x	x
Timber harvesting			x					x		x
Reforestation	x						x			x
Urban/Suburban Growth										
Construction			x		x			x	x	x
On-site sewage systems	x	x		x		x				
Stormwater runoff	x	x	x	x	x	x	x	x	x	x
Land cover removal	x	x	x	x	x	x	x	x		x

Nonpoint Source	Nutrients	Fecal coliform	Sediments	pH	Volatile Organics	Low Dissolved oxygen	Pesticides	Flow	Metals	Temperature
Habitat Alteration										
Channelization			x			x		x		x
Draining of wetlands	x		x					x		x
Vegetative clearing			x			x	x	x		x
Recreation										
Marinas and boats	x	x			x	x			x	
Off-road vehicles			x						x	

Chapter 3
Being in a State of Clean Water

> *It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration for land and a high regard for its value. By value, I of course mean something far broader than mere economic value; I mean value in the philosophical sense.* *Leopold, 1948*

Even though the preceding chapters have shown that the overall quality of water in Washington is less than optimum, we can have clean water. We can have clean water for every designated use determined by law. It only takes a determined will. Having a splendid quality of life and the freedom to enjoy our environment is the right of every citizen in the state. It starts with a clean water attitude. Some people think that it is impossible ever to have clean water; some people think that we can—the resultant state of clean water depends upon our collective attitudes. Thus, the goal of this water quality plan is to:

> Protect and restore water quality by creating a culture in Washington State that values ecosystem health and biodiversity.

In developing this strategy, we had numerous interviews and conversations with agencies, local governments, special purpose districts, and the general public. The discussion always led to clean water. There were abundant ideas on ways to achieve clean water because it was clear that was what everyone wanted. This plan will identify both technical fixes for those things that are broken and educational opportunities to teach people about their connections to the land.

When natural systems are properly functioning, they have the ability to filter contaminants, stop contamination from entering water bodies, and then restore themselves. For example, a properly functioning wetland will filter contamination before releasing water to either surface or ground sources. This ability of nature, when given a chance, becomes the impetus for developing the following set of objectives.

The Objectives of this Water Quality Plan are:

- Restore and maintain degraded systems/habitats
- Support sustainable human communities
- Sustain biodiversity
- Preserve natural ecosystems
- Focus funding on the most effective strategies
- Teach about connections between individual actions and clean water

1. Restore and maintain degraded systems/habitats.

Many Washington State habitats need to be restored. Preeminent among them are riparian areas and wetlands. Properly functioning riparian areas and wetlands can trap stormwater runoff and filter contaminants. They provide wildlife habitat and places where people can enjoy nature. Properly functioning natural systems provide many benefits to the human community.

2. Support sustainable human communities

Sustainable development is a strategy by which communities seek economic development approaches that also benefit the local environment and quality of life. Sustainable development provides a framework under which communities can use resources efficiently, create efficient infrastructures, protect and enhance quality of life, and create new businesses to strengthen their economies. It can help us create healthy communities that can sustain our generation, as well as those that follow.[18] Examples of sustainable human communities include non-traditional planning and land use, landscape scale analysis, and low impact development.

3. Sustain biodiversity

Washington is rich in natural biological diversity (biodiversity). Biodiversity refers to the variety of life forms at all levels of species organization—from molecular to landscape. Biodiversity is usually quantified in terms of numbers of species, which is defined as richness. This richness in species diversity is due to the tremendous variety of habitats within the state.

In 2002, the Washington State Legislature provided strong leadership in addressing biodiversity conservation by passing Engrossed Substitute Senate Bill 6400, an act relating to biodiversity conservation. ESSB 6400 requested a comprehensive review of the state's needs for biodiversity data and conservation, and resulted in the formation of the Washington Biodiversity Council, with members appointed by the Governor. The council is charged with formulating a 30-year prioritized strategy to protect and recover the state's biodiversity.

When we look at the dynamics of environmental processes, we must be able to see the big picture of nature in action. When we do that, we begin to understand the effects of our actions on both human and nonhuman populations, and can thus choose a different course than the one we are on. "We do that because lost biodiversity means we must spend more on keeping our water drinkable, air breathable, and natural resources harvestable. Lost diversity also reduces nature's ability to stimulate our culture and bolster our health."[19]

4. Preserve natural ecosystems.

Functioning, natural ecosystems should be protected because they are critical for a healthy environment. Some of these include critical areas, riparian zones, healthy forest habitats, and wetlands. Why is it important to preserve natural ecosystems? There are a number of reasons, but perhaps the most important is the services natural ecosystems provide to humanity. These services maintain biodiversity and the production of ecosystem goods, such as food, fiber, and many pharmaceuticals. In addition to the production of goods, ecosystem services support[20]:

- Purification of air and water.
- Mitigation of droughts and floods.
- Generation and preservation of soils and renewal of their fertility.
- Detoxification and decomposition of wastes.
- Aesthetic beauty and intellectual stimulation that lift the human spirit.

5. Focus funding on the most effective strategies

We are still in a break it/fix it mode of being. Even though there is movement toward sustainability, we need to fix problems effectively and prevent problems from happening. To do this takes time and money.

However, financial managers at both the state and federal levels are getting impatient for the state to show achievable results. After years of funding planning and implementation projects, there is still uncertainty about the effectiveness of these projects to improve water quality. Therefore, it is imperative that the state fund projects that "will get the job done." That places much responsibility on both the local recipients of funds and fund administrators to make sure that when projects are chosen for funding, measurable outcomes are identified and achieved.

6. Teach about connections between individual actions and clean water

There is an old statement that natural philosophers use that claims, "everything is connected to everything else." This statement is pertinent when we look at how the land is used and the resultant environmental degradation. Conversion of land to residential, commercial, and industrial uses results in loss of habitat. However, habitat degradation also occurs when landowners do not care for their land in ways that are environmentally protective. Usually this happens because someone truly does not understand their connection to the land and how their actions impact the landscape. To teach about these connections becomes crucial to the successful implementation of this nonpoint plan.

How Will We Achieve These Objectives?

There are several ways that the objectives will be fulfilled. The most important way will be to continue building and sustaining relationships with federal, state, and local entities and to create understanding about the cause and effect of water quality impairments. We will use the following strategy to achieve our objectives.

Sustain Relationships – We will continue to build on the relationships between agencies and groups working to address nonpoint pollution problems. The realization that no one agency can get the job done is understood and part of that understanding is to respect the role of the "other" and to share with them results, issues, and other pertinent information about water quality. In addition, we will strive to work in cooperative ventures to solve problems.

Local Problem Solving - The best solutions are often developed by the people closest to the problem. Since most nonpoint pollution is generated by local land uses and individual actions , local people are the best ones to solve most water quality problems. Federal and state agencies are encouraged to work closely with local problem solvers, both agencies and citizens, and to help in their efforts through technical, financial, and educational assistance.

Innovative Approaches - The state needs to continue developing innovative approaches for agricultural BMPs, new sources of funding, riparian protection and habitat enhancement, septic system repairs, low impact development, stormwater alternatives, marina pumpouts, and any other number of solutions for nonpoint source control. We need to allow for innovations, to test results, and determine if a new idea actually works.

Environmental Education - Environmental education about nonpoint sources of pollution is a vital tool to prevent pollution before it happens. Developing educational programs, involving the public, increasing public understanding about pollution, and promoting volunteerism are ways this important element can be achieved. Teaching about connections to the land, the value of biodiversity, and what it means to be sustainable human communities are all imperatives if this plan is to be successful.

Scientific Knowledge - The need to increase understanding through scientific knowledge and increased monitoring is essential to solving the nonpoint source problem. By its very nature, it is difficult to pinpoint specific causes of nonpoint source pollution and because of that, it is difficult to determine effectiveness of programs. Nonpoint sources of pollution should be understood as a system-wide issue. Effectiveness monitoring, ambient/trend monitoring, and targeted monitoring studies to identify and solve specific pollution problems are key components of this element.

Financial Assistance - Agencies will be encouraged to streamline their financial assistance programs to provide equitable and reliable funding to nonpoint efforts. Focused funding on the most manageable problem areas and shared funding will be emphasized in the next five years.

Implement BMPs – The state will fund best management practices that have gone through rigorous testing and peer review. The state has adopted and funds eligible BMPs identified in the Aquatic Habitat Guidelines, Natural Resource Conservation Service field office technical guides, Washington State University publications, and NOAA's management measures.

Enforcement - Agencies will be encouraged to use their enforcement capabilities in a more effective fashion..

These tools will form the basis of the actions found in Chapter 5.

Chapter 4
Roles in Implementation: Water Quality Partners: Working with Local, State, Tribal, and Federal Agencies

> *In short, a land ethic changes the role of Homo sapiens from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such.* *Leopold, 1948*

The complexities of Washington environments and the mandates of various agencies to protect water quality and other resources are many. Even though agencies have individual mandates, it is imperative that these agencies work together to solve water quality problems. Many of the programs identified in this plan call for joint efforts. This chapter details the individual nature of the agencies as well as the reason a unified approach is necessary.

Local Governments

The three basic forms of local government in Washington are:

1. Counties
2. Cities
3. Special purpose districts

The 39 counties of Washington were established by acts of the legislature, and are considered subdivisions of state government. Basically, the county was designed to serve as an administrative unit of the state in rural areas. The same holds true for cities and special purpose districts. As subdivisions of state government, all three are called upon to implement state legislative mandates.

Prior to 1960, several types of districts were formed to deal with an array of issues, which sometimes include environmental protection:

- Conservation districts
- Health districts
- Water districts
- Sewer districts
- Public utility districts
- Weed control districts

Since 1960, many new types of special purpose districts have been authorized by the legislature, especially with regard to environmental protection. These new environmentally-oriented districts include:

- Groundwater protection districts
- Lake protection districts
- Shellfish protection districts
- Solid waste management districts
- Stormwater utility districts

Many state laws are implemented by local governments, with state agencies in an oversight and/or support role. With regard to the environment, local governments and special districts have primary authority or major implementation efforts in:

- Solid waste management.
- Growth management and land use.
- Stream restoration and rehabilitation .
- Sewage systems, both on- and off-site.
- Road construction and maintenance.
- Shorelands management.
- Stormwater management.
- Drinking water protection.
- Used oil and household toxics.
- Irrigation water and return flows.

Local Government Implementation Activities

Volume 1 of the nonpoint plan, *Water Quality Summaries for the 62 Water Resource Inventory Areas (WRIAs) of Washington State*[21] provides a series of summaries that profile each major watershed in Washington State. The information contained in these watershed summaries can be used to better understand the relationships between demographics, land-use activities, and water quality problem areas. Data from the summaries can be used to help support watershed-based planning efforts and subsequently those local water quality plans that are incorporated into Volume 1 will be adopted by reference as part of Washington's overall water quality plan.

Local governments and special purpose districts are the on-the-ground implementers of many nonpoint pollution control activities. This nonpoint management plan relies heavily on the continued commitment of energy and resources by these entities. Many current and planned actions in this plan are designed to assist them with their implementation efforts. Another large role that local governments play is in monitoring and correcting nonpoint pollution. State agencies need to assist local governments with monitoring and enforcement.

State agencies can also assist with financial assistance through the various funding programs they administer. The agencies can promote state priorities by funding projects and programs designed to achieve them.

Washington State Agencies

Washington's constitution divides state government into three branches: the executive, the legislative, and the judicial. However, the structure of each of these branches is distinct from the federal model in many ways. Probably the most significant difference is in the executive branch, which actually consists of nine elected officials. Although the Governor is considered chief executive, that office does not have authority over the other eight elected officials. The other positions with elected executive officers are:

Lieutenant Governor	Secretary of State
State Auditor	State Treasurer
Attorney General	Commissioner of Public Lands (DNR)
Superintendent of Public Instruction	Insurance Commissioner

The Governor does not appoint all state agency executives. Many of these are appointed by independent commissions. Some of the areas of government or agencies with commission-appointed executives include:

Conservation Commission
Transportation
Fish and Wildlife
Universities and Colleges
Parks and Recreation

These commissions and the Commissioner of Public Lands, have an effect on the state's natural resources, and specifically on nonpoint pollution, but are not accountable to the Governor.

The natural resource agencies that have governor appointed directors and are under the authority of the Governor include:

Outdoor Recreation
Department of Ecology
Department of Agriculture
Department of Health
Community Trade and Economic Development
Puget Sound Action Team

The greatest impact of state agencies on public policy is from the ability to use a consensus based problem-solving approach to address challenging natural resource issues with other vested stakeholder; regulations they promulgate; their technical assistance programs; and from the grants they award, to carry out tasks mandated by statutes.

The complexities of Washington State government and the differing authorities of the several agencies responsible for controlling nonpoint source pollution have made cooperative efforts difficult. Staff time is usually at a premium and efforts to participate with other agencies are often a low priority. However, the need to share resources, efforts, and programs is recognized as essential. The Joint Natural Resources Cabinet was an attempt to coordinate around salmon, and the Puget Sound Action Team is an example of coordination among agencies and others under a regional plan to protect Puget Sound. For the nonpoint plan, a strategy was developed to help create working partnerships and linkages with appropriate state, tribal, regional, and local entities to address critical nonpoint pollution issues.

Washington State Agency Nonpoint Workgroup

During the writing of the first nonpoint plan five years ago, it became apparent that no single state agency had all the tools to solve nonpoint source pollution problems. All state natural resource agencies have some type of control program mandated by state legislation. Thus, in October of 1999, the Director of Ecology sent a letter to other state agencies inviting membership on a state agency nonpoint workgroup. By January of 2000, most agencies had agreed to the idea, and in April the workgroup was formalized (Table 4.1). A few months later, the workgroup was established as a class one committee in the Governor's office. Class one groups have responsibility for major policy decisions and make a significant demand on the time and resources of its members. It is expected that the role of this workgroup will expand as advanced planning and implementation of the state's nonpoint plan evolves.

Table 4.1
Washington State Agency Nonpoint Workgroup

Agency	Director 12/31/2004	Designee	Representative
Agriculture	Valoria Loveland	Kirk Cook	
Conservation Commission	Mark Clark	Stu Trefry	
Department of Community Trade and Economic Development	Juli Wilkerson	Doug Peters	
Cooperative Extension	Jim Zuiches	Dr. Ed Adams	Bob Simmons
Ecology	Jay Manning	Helen Bresler	
Fish and Wildlife	Jeff Koenings	Carl Samuelson	
Health	Mary Selecky	Selden Hall	
Natural Resources	Doug Sutherland	Carol Walters	
Parks and Recreation Commission	Rex Derr	Chris Regan	
Puget Sound Action Team	Brad Ack	Harriet Beale	
Transportation	Doug MacDonald	Tim Hilliard	

Washington State Nonpoint Workgroup during the fall meeting in Leavenworth, Washington. October 2004

Role of the Workgroup:

Twice each year the group meets to discuss general work plan activities. At these meetings, progress is reviewed and adjustments made as necessary to work plans and schedules. More frequent meetings will be held between partnering agencies to plan and carry out projects requiring coordination. Major items in the group's work plan are:

1. Review water quality reports.
2. Review various implementation reports (as available).
3. Review progress on implementation commitments (Chapter 5).
4. Collaborate on new ideas for solving nonpoint source pollution.
5. Advise Ecology on changes needed to the nonpoint plan.
6. Oversee the use of the Direct Implementation Fund (See Chapter 7).

State Agency Implementation Table

The table of implementation activities found in Chapter 5 will be the responsibility of Washington State agencies. The workgroup developed the implementation table as a means to identify existing programs and to identify actions that were needed in order to accomplish a full range of nonpoint source controls.

We have attempted as much as practicable to coordinate implementation activities with other major planning efforts, for example, the state salmon recovery strategy, *Extinction is not an Option (1999),* the *Puget Sound Water Quality Management Plan*, and the *Forests and Fish Report.*

Federal Agencies

There are many federal agencies in Washington that operate with different mandates and responsibilities. This is in large part due to the diversity and complexity of Washington's natural environment.

For example, the strategic location of the Puget Sound region makes it an ideal home for several military installations such as Fort Lewis, Puget Sound Naval Shipyard, Bangor submarine base, and Whidbey Island Naval Air Station. The Puget Sound region is surrounded by USFS lands and the Olympic National Park.

The Palouse region of eastern Washington is the home of some of the most productive non-irrigated agricultural lands found anywhere in the United States. These lands are in close proximity to the Snake River and Columbia River. Interested federal agencies are the Natural Resource Conservation Service (NRCS), Farm Service Agency (FSA), The Bureau of Reclamation, Bonneville Power Administration (BPA), and the Army Corps of Engineers (COE).

The Yakima Valley is another good example of federal agency presence. Not only are NRCS and FSA actively engaged with agricultural activities, the Bureau of Reclamation (BOR), the Corps of Engineers, and the Bonneville Power Administration all have responsible roles and mandates. In addition, the US Army's Yakima Firing Range is one of the largest military bases in the United States.

These are a few examples of the roles federal agencies play in using and managing state lands. Federal agencies are the second largest group of landowners in the state (next to private individuals)--and a major source of funding for cost share and restoration efforts.

List of Federal Agencies and Responsibilities

Many federal agencies in Washington either contribute to nonpoint source pollution, or help control nonpoint source pollution through their water quality programs – or both.

- Army Corps of Engineers - COE is responsible for maintenance of harbors and navigable waterways and wetlands management. COE operates and maintains many large dams along the Columbia and Snake Rivers.
- Bonneville Power Administration- BPA controls numerous dams along the Columbia and Snake Rivers.
- Bureau of Land Management - BLM has relatively small holdings within the state on which grazing activities occur.
- Bureau of Reclamation - BOR owns and manages hundreds of miles of irrigation canals in eastern Washington, and some hydroelectric dams.
- Department of Energy - DOE manages the Hanford Reservation.
- Department of Defense - DOD has several bases in Washington, due to the strategic location of the state and its access to the Pacific Rim.
- Environmental Protection Agency administers the Clean Water Act.

- Federal Highway Administration - FHA has hundreds of miles of highways in Washington.
- Fish and Wildlife Service - FWS is responsible for habitat conditions related to the health and well-being of fish and wildlife. FWS works to protect ESA-listed resident fish such as bull trout and cutthroat trout.
- U. S. Geological Survey - USGS routinely monitors both surface and ground water through its National Water Quality Assessment Program.
- Natural Resource Conservation Service - NRCS provides financial and technical assistance to landowners in developing and implementing conservation practices.
- National Park Service - NPS owns thousands of acres of parkland, including Mount Rainer National Park, Olympic National Park, and North Cascades National Park.
- NOAA Fisheries - NMFS oversees the status of endangered fish species.
- US Forest Service - USFS has large holdings in the state.

Table 4.2
Matrix of Agency Nonpoint Responsibilities

Nonpoint Category	Agriculture	Forest Practices	Urban/Suburban Growth	Recreation	Habitat Alteration	Other Activities
State Agencies						
WSDA	Pesticide use licensing and containment, Chemigation and Fertigation; Promotes watershed stewardship; Collects unusable pesticides from farmers Implements Dairy Nutrient Management Act	Pesticide use	Pesticide use, Home-to-Ocean, Pest Control	Management of noxious weed permit	Spartina and Purple loosestrife control	
CTED	GMA development guidelines and technical assistance; designating and protecting critical areas	GMA development guidelines and technical assistance; designating and protecting critical area.	GMA development guidelines and technical assistance; designating urban growth areas	Parks and recreation guidebook	GMA development guidelines and technical assistance; critical areas designation	Guidance on Urban Design and Urban Density
CC	Technical assistance and training; Grants to CDs; Facilitates local/State/ federal partnerships	Technical assistance, grants to CDs				
CRAB			Technical assistance to counties on transportation issues			
DOH	Pesticides		On-site sewage standards; evaluates new technologies for on-site sewage	Shellfish classifications	Sewage	Management of mosquito permit
ECY	Pesticides; Water rights; Enforcement; Technical assistance; funding; permits, air quality	Rule development; Wetlands policy; Landscape TMDLs; Small landowners assistance; shoreline management, CMER	Erosion control, Pollution prevention, Runoff; Funding on-site sewage programs; air quality of sediments on roads, highways, and bridges	Reviews facilities siting	Conducts 401 certifications; Oversees the shoreline management act; Regulates dam construction Statewide wetland policy; Technical assistance; Lake restoration funding; Aquatic pesticide control	State NPS Management Plan development and oversight, Education and outreach, TMDL development, Monitoring, Grants and loans.
WDFW	Technical assistance on habitat issues; HPA enforcement; assists with riparian standards	Consultation; HPA issuance and enforcement	HPA	HPA	HPA issuance and enforcement, In-stream habitat; Mitigation, Enhancement, funding	

Nonpoint Category	Agriculture	Forest Practices	Urban/Suburban Growth	Recreation	Habitat Alteration	Other Activities
IAC				Off-road vehicle policy, funding		Salmon recovery funding
PSAT	PS Plan addresses ag nps pollution through watershed planning and implementation of agricultural practices and in the PS work plan that helps fund pesticide education and farm planning activities.	PS Plan address forest practices through local watershed planning and implementation	Maintains and updates policies for on-site sewage, shellfish, and stormwater planning in Puget Sound; facilitates tech assistance to locals; Regional work to promote low impact development, funds, education projects.	PS Plan addresses boater/marina issues, biennial work plan includes funding for boater education.	PS Plan and biennial work plan to coordinate policies and science on habitat protection and restoration; funds education projects for shoreline owners and others; develop and implement nearshore science in protection and restoration.	Through PS Plan and biennial work plan coordinates state, federal, tribal agencies and others for conservation and recovery in Puget Sound; funds community education; helps coordinate Hood Canal cleanup efforts; reporting on status of water quality, habitat and species recovery.
DNR	Grazing	Issues forest practices permits; Enforces forest practice rules; Carries out watershed analysis; Educates forest landowners; provides forest management assistance to communities; manages state trust forestland		Trails; Proprietary management of state-owned aquatic lands; Reviews facilities siting, design and construction; Issues Use Authorizations.	Riparian Habitat; Wetlands mitigation; Proprietary management of state-owned aquatic lands including shellfish, sediment, aquatic plants, and the benthic and epibenthic community.	Steward of state's aquatic lands – providing commercial (shellfish production), recreation, and aesthetic values.
Parks	Grazing, Weed Management	Arbor Crew	Runoff, On-site	Sewage, access, marinas	Shoreline access, Riparian habitat; Mitigation	
WSWSDOT			Roads, bridges, runoff		Mitigation	
WSU	Water Quality education, BMP education; develops new BMPs	BMP education to small, non-industrial landowners	Home-a-syst; landscape and residential BMPs; provides educational outreach to general public		BMP education	
USFS	Harvest, Roads, Runoff	Watershed analysis on federal forestlands; financial assistance to small non-industrial forest landowners		Off-road	Habitat Protection	

Federal Agencies	Agriculture	Forestry	Urban/Suburban Growth	Recreation	Habitat Alteration	Other Activities
NRCS	Technical assistance; funding; Implements federal conservation programs	Technical assistance to small non-industrial landowners			Protection	
FWS					Protection	
BPA	Irrigation				Dams	
NPS				On-site, Runoff		
FHA			Roads, highways, bridges		Mitigation	
DOD	Harvest		Runoff, Construction	Marinas, boats		
COE					Issues permits for dredging and filling; Provides funding for restoration; Mitigation, Protection; Addresses habitat issues	
USGS	Monitors		Monitors			
NMFS	Consultation	Consultation	Consultation		Consultation	
BLM	Grazing	Harvest				
EPA	Columbia Basin Initiative; TMDLs	TMDLs	Urban Pesticide Initiative		Floodplain Restoration	Water Quality standards review and approval
NOAA	Coastal zone management measures	Coastal zone management measures	Coastal zone management measures	Coastal zone management measures	Coastal zone management measures	Coastal zone management measures
Cities	GMA	Urban forestry	Runoff, Construction, Development		Shoreline Master Program; Critical Areas,	
Counties	GMA; Addresses issues related to public health	Forest land conversions	Runoff, construction, and development.		Shoreline master Program; Critical Areas,	NPS education programs, TMDL development, Monitoring, salmon recovery, volunteer coordination
Special Districts	Technical assistance	Technical assistance				

Chapter 5
Activities and Milestones

> *Land, then, is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals. Food chains are the living channels that conduct energy upward; death and decay return it to the soil. The circuit is not closed; some energy is dissipated in decay, some is added by absorption from the air, some is stored in soils, peats, and long-lived forests; but it is a sustained circuit, like a slowly augmented revolving fund of life.* *Leopold, 1948*

Recipients of state and federal grants are under increasing pressure to show results. The pressure is coming from government financial analysts at both the state and federal levels who are anxious to show successes for major programs. If funding for water quality programs is to continue, then it becomes imperative for recipients to address these concerns. Thus, this chapter is dedicated to identifying measurements of success and the activities needed to achieve those ends.

Outputs vs. Outcomes

There are two major programs that have audited Washington's water quality control efforts.

- Washington State Joint Legislative Audit and Review Committee (JLARC)
- The Federal Office of Management and Budget (OMB)

Joint Legislative Audit Review Committee
In 2001, The Washington State Joint Legislative Audit and Review Committee (JLARC) examined the performance of 12 capital budget-funded grant and loan programs that fund environmental quality projects.[22] The audit reviewed the performance of these programs from an investment perspective–a new way of examining the performance of such programs. Two questions were asked, 1) What are the results of the investments made thus far, and 2) Which investment practices are in place to produce desired long-term results?

The JLARC study evaluated program activities and investments for three categories.

1. **Process Outputs** – These were measurements of basic process and workload activities involved in or resulting from program administration. Examples include: number of applications processed, number of projects funded, number of contracts signed, number of grants/loans awarded, and descriptions of projects funded.

2. **Project Outputs** – These were measurements of the implementation of "on-the-ground" activities that represent the functional core of projects. Examples include: acres of land purchased, miles of stream buffered, number of dairy plans completed, number of boat pumpouts installed, number of wastewater treatment facilities brought into compliance with standards, and amount of sewage removed.

3. **Project Outcomes** – Finally, these were measurements of the overall impact and effectiveness of the project—that is, whether and to what extent the project

accomplished its overall mission and goals as expressed in terms of environmental quality. Examples include: cleanliness of a previously contaminated site, percent of critical habitat needed by a species preserved or restored, measurable improvements in water quality, and demonstrated recovery of endangered species.

JLARC (2001) found that the vast majority of information collected and published by programs regarding their investments focuses on process results, such as number of applications processed, number of projects funded, and descriptions of projects. A few agencies collect and publish output results, such as number of habitat acres purchased, number of stream miles buffered, and amount of sewage removed from state waters. However, as a whole, little information is available regarding project or program outcomes—that is, information that can better address whether investments are effective in accomplishing their fundamental environmental quality goals. Without strong and comprehensive output and outcome measures, positive environmental results can only be presumed and not proven.

Federal Office of Management and Budget (OMB)

Beginning with Federal Fiscal Year 2004, OMB will annually review and rate 20 percent of all federal programs. The Clean Water Act Section 319 grant program for nonpoint source pollution was included in the FFY04 review. The 319 program is EPA's Nonpoint Source Program, and annually provides states $238 million for nonpoint source control.

Section 319(h)(11) requires states to report annually on what their nonpoint source programs are accomplishing, including available information on load reductions and actual water quality improvements. OMB gave a rating of 32 (out of 100) and a "Results not Demonstrated" conclusion. Key factors that led to this conclusion were as follows.

1. The program has not collected sufficient performance information to determine whether it has had a significant effect on pollution.

2. The program's greatest weakness is lack of strategic planning and thus the inability to effectively measure program results. Consequently, the program lacks adequate long term, annual, and efficiency measures.

Because of OMB's conclusions, EPA is stressing three areas that need to show accomplishments.

1. Long-term measures – number of waters that show improvement by 2012

2. Annual measures – reductions in sediment, nitrogen, and phosphorus

3. Efficiency measures – total dollars spent per each waterbody improvement.

EPA and the states have been working to improve their ability to account for what has been accomplished with Section 319 funds. The Section 319 Grants Reporting and Tracking System (GRTS) is the main reporting vehicle for the Section 319 program. This system has historically focused on very limited aspects of Section 319 program implementation, such as general identification of geographic areas where projects are located and types of projects funded. EPA has recently modified the GRTS requirements to include information on environmental

outcomes. The new reporting elements will expedite states' ability to achieve the requirements of Section 319(h)(11) to annually report available information on load reductions and actual water quality improvements. Based on EPA's new focus, this strategy will address only outcome performance measures.

Outcome Performance Measures

This plan will focus primary attention on attaining the following national targets set by EPA for attaining water quality—they are:

- Reduction in sediment, measured in tons;
- Reduction in nitrogen, measured in pounds;
- Reduction in phosphorus, measured in pounds.

In addition to the national targets, numerous conversations took place with staff from state agencies on the nonpoint workgroup, and through those, we identified the following attainable measurement of success.

- Miles of riparian areas restored.

Without minimizing the importance of attaining the outcomes listed above, focused secondary attention will be on the following:

- Other water quality parameters
- Number of people attending water quality education events;
- Number of people receiving technical assistance training;
- Number of meaningful relationships created and sustained;
- Number of high priority water quality projects funded.

These can be attained through any of the source control programs and activities identified in this plan. Each activity in the Table 5.1 lists a measurable outcome, of which these performance measures are listed under several activities.

Tracking these performance measures will occur through grant reports, agency reports, and monitoring activities.

Activities Table

This plan's activities are divided into two broad categories. The first are those programs that are currently being implemented by local governments, tribes, and special purpose districts. This plan assumes that all existing programs will continue.

The second category includes programs that are being implemented at the state level. Table 5.1 lists both existing state programs and new program additions. In either case, these actions are designed to enhance the current state of nonpoint source controls by implementing the full array of plan objectives. New program additions have not necessarily received funding or administrative blessings, but it is our hope that implementing agencies will work toward that end.

Implementation actions are organized by nonpoint pollution source category. Where activities are related to another major planning process in Washington, this has been indicated. The responsible organization for each activity has been listed with the lead agency underlined. A list of acronyms for each agency is found in the front of the plan.

Please Note, not every action will lead to a measurable outcome. Some actions will lead to qualitative outcomes, which are not measurable, but we anticipate will lead to water quality improvements. For example, an action to provide outreach and education to a targeted group of people on riparian area functions will not lead directly to measurable water quality outcomes, but is an important nonpoint control action to undertake.

Table 5.1
Actions to Manage Nonpoint Pollution in Washington State (2005—2010)

Objectives to be fulfilled (See Chapter 3)	**Through these Agriculture Activities**	**Lead Entity--** Cooperators	**Measurable Outcome**	**Major Program Linkage**
Existing Programs				
Focus funding on most effective strategies	Ag 1: Implement statewide the CIDMP to facilitate development of irrigation district plans.	**WSDA, CC**, ECY, WDFW	Reductions in sediment.	Salmon Strategy, Agr-1
Focus funding on most effective strategies	Ag 2: Expand well water protection funding and prioritize technical support and compliance inspections to agricultural producers.	**WSDA** ECY		
Restore and maintain habitats	Ag 3: Continue to refine and update regulatory program for pesticide applications.	**WSDA,** ECY		Puget Sound Plan, PS-2
Restore and maintain ecosystems	Ag 4: Provide technical assistance on proper use of pesticides to ensure compliance with pertinent regulations.	**WSDA**		Puget Sound Plan, PS-2
Restore and maintain ecosystems	Ag 5: Continue to research, develop, test, and evaluate agricultural best management practices.	**WSU** ECY	Reductions in sediment.	
Support sustainable human communities	Ag 6: Actively engage producer groups in implementing new best management practices.	**WSU, CC, ECY**	Number of educational events, participants and acres affected.	Puget Sound Plan, PS-1
Focus funding on most effective strategies	Ag 7: Continue to implement the Conservation Reserve Enhancement Program and look for O&M solutions.	**CC**	Reductions in sediment.	
Focus funding on most effective strategies	Ag 8: Use SRF low interest loans to help agricultural commodity groups with development and installation of BMPs that water pollution, air pollution, and water use.	**ECY**		Puget Sound Plan, AG-1
Teach about connections	Ag 9: Provide outreach and education to the agricultural community on riparian area function and management related to agricultural land uses.	**WSU ECY**	Number of educational events, participants and acres affected.	Puget Sound Plan, MFH-1

Objectives to be fulfilled (See Chapter 3)	**Through these Agriculture Activities**	**Lead Entity--** Cooperators	**Measurable Outcome**	**Major Program Linkage**
Support sustainable human communities	Ag 10: Implement the Irrigation Efficiencies program statewide.	**CC**	Reduction in sediment.	
Teach about connections	Ag 11: Implement the IPM certification program statewide.	**WSU, WSDA**	# of new operators certified.	Puget Sound Plan, PS-2
Teach about connections	Ag 12: Implement an education and outreach program related to whole farm Phosphorus balance, the Phosphorus Index, and feeding management.	**WSU, CC, WSDA**	Number of agricultural landowners served. Number of workshops offered.	
Teach about connections	Ag 13: Develop environmental marketing pilot project to get agricultural producers to implement BMPs.	**WSU, ECY, CC**		

Objectives to be fulfilled(See Chapter 3)	**Through these Forestry Activities**	**Lead Entity--** Cooperators	**Measurable Outcome**	**Major Program Linkage**
Existing Programs				
Restore and maintain habitats	For 1: Implement the forest practices rules that pertain to water quality protection.	**DNR, ECY**, WDFW, WSDA	Improve water quality in forested habitats; effective compliance; monitoring and enforcement.	Salmon Strategy, For-1
Restore and maintain habitats	For 2: Work to obtain federal assurances under the Clean Water Act and the Endangered Species Act for forest practices conducted on non-federal forest lands.	**DNR, WDFW, ECY, WSDA**	Federal assurances obtained.	Salmon Strategy, For-3
Preserve natural ecosystems	For 3: Continue to implement a state Forest Riparian Easement Program (FREP) to allow timber leases for conservation purposes.	**DNR**	Number of acres.	
Sustain biodiversity	For 4: Continue to implement the Family Forest Fish Passage Program.	**DNR**	Number of culverts replaced.	

Objectives to be fulfilled(See Chapter 3)	**Through these Forestry Activities**	**Lead Entity--** Cooperators	**Measurable Outcome**	**Major Program Linkage**
Restore and maintain habitats	For 5: Continue to implement the Alternate Plans Program.	**DNR**	Number of alternate plans completed.	
Support sustainable human communities	For 6: Carry out functions of the Small Forest Landowners Office that relate to water quality protection.	**DNR**	Number of small forest landowners served.	Puget Sound Plan, FP-3 Salmon Strategy, For-4
Teach about connections	For 7: Educate small forest landowners on water quality and ESA issues, and new RMAP rules.	**DNR, WSU,** Parks, WDFW ECY	Number of educational events, participants and acres affected.	Salmon Strategy, For-10
Focus funding	For 8: Continue to implement the forest land enhancement program to family forest owners. Provide cost-share funding and education on erosion control, water quality, wetlands, and fish habitat protection.	**DNR**	Reduction in sediment; improved fish habitat and wetland protection.	Salmon Strategy, For-10
Focus funding	For 9: Use SRF low-interest loans to help small forest landowners with implementing BMPs required by the forest practices act.	**ECY, DNR**		Salmon Strategy, For 10,11
Teach about connections	For 10: Field foresters continue providing technical assistance to landowners and tribes, and to provide enforcement ability.	**ECY**		
Restore and maintain habitats	For 11: Continue participation in forest practices adaptive management program.	**ECY**		
New Program Additions for 2005				
Focus funding	For 12: Expand the Urban Community Forestry Program to meet current requests for assistance from local governments.	**DNR, cities**	Number of communities with urban forestry programs served.	

Objectives to be fulfilled (See Chapter 3)	**Through these Urban and Suburban Activities:**	**Lead Entity--** Cooperators	**Measurable Outcomes**	**Major Program Linkage**
Existing Programs to Control Stormwater Runoff				
Support sustainable human communities	Urb 1: Continue to provide road maintenance guidelines and technical assistance to local communities.	**WSDOT**, PSAT, ECY		Puget Sound Plan, SW-3
Support sustainable human communities	Urb 2: Continue to promote low impact development to WA State communities through assistance, research, and demonstration projects, and by providing assistance to revise existing ordinances and development standards to allow for low impact development..	**PSAT**, ECY, **WSU**	Number of local governments with ordinances that allow for or encourage LID.	Puget Sound Plan, SW-1
Restore and maintain habitats	Urb 3: Continue to manage runoff from state highways using the updated highway runoff manual.	**WSDOT**		Puget Sound Plan, SW-4
Support sustainable human communities	Urb 4: Identify and participate in a low impact project and research the applicability of low-impact techniques to regional hydrogeology, soils, and climactic conditions.	**PSAT, CTED, ECY**	Credits for LID techniques updated in Ecology stormwater manual.	Puget Sound Plan SW-1
Restore and maintain habitats	Urb 5: Develop methods and procedures for watershed-based runoff, streamflow, and water quality mitigation measures, with a goal of resource recovery in place of patchwork, incremental mitigation as practiced in the past.	**WSDOT**		Puget Sound Plan SW-1
Support sustainable human communities	Urb 6: Develop a model clearing and grading ordinance to include low impact development. Partner with resource agencies to utilize regional staff in updating ordinances. Implement a series of workshops around the state on legal obligations of land use planning.	**CTED,** PSAT		Puget Sound Plan SW-3
Preserve natural ecosystems	Urb 7: Update guidelines and models for consideration by counties and cities on inclusion of Best Available Science and giving special consideration to salmon conservation in their local GMA Critical Areas Ordinances.	**CTED,** PSAT		Puget Sound Plan MFH-2
Support sustainable human communities	Urb 8: Continue to research stormwater technology design, cost benefit and know-how to effectively address stormwater problems. Educate to key audiences about new findings, etc.	**ECY, PSAT**		Puget Sound Plan SW-7

Objectives to be fulfilled (See Chapter 3)	**Through these Urban and Suburban Activities:**	**Lead Entity--** Cooperators	**Measurable Outcomes**	**Major Program Linkage**
New Program Additions to Control Stormwater Runoff for 2005				
Support sustainable human communities	Urb 9: Educate key audiences in the best available science in Pacific Northwest stormwater management and low impact development techniques.	**WSDOT,WSU ECY, WDFW, PSAT**	Number of local governments assisted. Number of developers and consultants served.	Salmon Strategy, Rea-4 Puget Sound Plan, SW-3
Support sustainable human communities	Urb 10: Promote adoption of Ecology's stormwater manual and other elements of a comprehensive stormwater program.	**ECY**, PSAT	Number of local governments adopting manual.	Puget Sound Plan, SW-2.4
Preserve natural ecosystems	Urb 11: Assess the impacts of urban and highway stormwater runoff on the quality of tideland, shoreland, and bedland sediments as well as biological resources and habitat, with particular emphasis on urban embayments in Puget Sound.	**DNR**, ECY, DOH, PSAT, WDFW	Number of acres impacted.	Puget Sound Plan SW-4
On-site Sewage Systems				
Teach about connections	Urb 12: Support local health jurisdictions in developing an effective education program on the importance of properly maintaining their onsite systems and how to do that.	**DOH**, PSAT		Puget Sound Plan, OS-2
Support sustainable human communities	Urb 13: Continue to work on the rule development process leading to adoption of new and revised rules by the Washington State Board of Health for on-site sewage systems up to 3500 gallons per day.	**DOH**, PSAT, ECY	Final rule.	Puget Sound Plan, OS-1
Support sustainable human communities	Urb 14: Continue to work on the rule development process leading to adoption of new and revised rule large on-site sewage systems over 3500 gallons per day by the Washington State Board of Health.	**DOH,** PSAT, ECY	Final rule.	Puget Sound Plan, OS-1
Focus funding	Urb 15: Continue to review and oversee the planning, design, construction, and operation of large on-site systems.	**DOH,** ECY		Puget Sound Plan, OS-4
Focus funding	Urb 16: Assist further development of local health districts capacity to manage their onsite sewage system inventory with electronic databases.	**DOH**, PSAT	Number of local health districts with GIS capacity for managing OSSS.	Puget Sound Plan, OS-2
Focus funding	Urb 17: Test innovative approaches for providing funds to homeowners to repair failing onsite systems.	**DOH**	% reduction of nutrients by tested units.	

Objectives to be fulfilled (See Chapter 3)	**Through these Urban and Suburban Activities:**	**Lead Entity--** Cooperators	**Measurable Outcomes**	**Major Program Linkage**
Focus funding	Urb 18: Inventory, prioritize, and repair failing onsite septic systems owned by Washington State Parks.	**Parks**	Number of systems repaired.	
Teach about connections	Urb 19: Test innovative approaches for onsite systems that remove nutrients during treatment.	**PSAT**	lbs of nutrients removed.	Puget Sound Plan, OS-5
New Program Additions for 2005				
Teach about connections	Urb 20: Develop educational activities necessary for implementing new and revised rules for on-site sewage systems up to 3500 gallons per day.	**DOH**	Number of people trained.	
Focus funding	Urb 21: Develop and share technical and administrative guidance to assist local health jurisdictions in the development and implementation of risk-based management plans.	**DOH,** PSAT		Puget Sound Plan, OS-2
Preserve natural ecosystems	Urb 22: Develop pilot program to address water quality violations associated with onsite sewage systems in sensitive areas.	**ECY,** DOH, PSAT		

Objectives to be fulfilled (See Chapter 3)	**Through these Recreational Activities**	**Lead Entity--Cooperators**	**Measurable Outcomes**	**Major Program Linkage**
Existing Programs				
Preserve natural ecosystems	Rec 1: Continue to implement the Comprehensive Boat Sewage Management Plan for Washington State.	**Parks,** PSAT	Reduction in F. coliform.	Puget Sound Plan, MB-3
Focus funding	Rec 2: Help fund local health districts to address pollution problems identified by the BEACH Program.	**DOH**	Reduction in F. coliform.	
Restore and maintain degraded ecosystems	Rec 3: Continue to implement the beach monitoring and notification program for recreational marine waters contaminated with nonpoint source pollution.	ECY, DNR, DOH		
New Program Additions for 2005				
Teach about connections	Rec 4: Fund education to prevent small oil spills and for citizen responses to oil spills.	**ECY**		Puget Sound Plan, MB-4 and SP-4

Objectives to be fulfilled (See Chapter 3)	**Through these Recreational Activities**	**Lead Entity--Cooperators**	**Measurable Outcomes**	**Major Program Linkage**
Preserve natural ecosystems	Rec 5: Assess the impact of nonpoint source pollution on nearshore marine vegetation with specific emphasis on the impacts of urban stormwater.	**DNR,** ECY, WDFW, PSAT	Identify key factors related to nonpoint pollution and loss of nearshore aquatic vegetation.	
Restore and maintain degraded ecosystems	Rec 6: Sample a cross-section of marinas in different physical settings around the state to determine if water quality standards are being met during peak use periods of the summer.	**DNR**,ECY, DOH, PSAT	Number or percentage of marinas meeting water quality standards.	
Restore and maintain degraded ecosystems	Rec 7: Assess the impacts of urban and highway stormwater runoff on the quality of tideland, shoreland and bedland sediments with particular emphasis on urban embayments in Puget Sound.	**DNR,** ECY, DOH, PSAT, WDFW	Number of acres of tidelands, shorelands and bedlands impacted by urban stormwater and highway runoff.	

Objectives to be fulfilled (See Chapter 3)	**Through Habitat Alteration activities.**	**Lead Entity-**Cooperators	**Measurable Outcome**	**Major Program Linkage**
Existing Programs				
Restore and maintain degraded ecosystems	Hab 1: Prioritize and coordinate restoration projects on a watershed basis.	**PSAT, ECY, WDFW**	Miles of riparian areas restored.	Puget Sound Plan, MB-4 and SP-4
Sustain biodiversity	Hab 2: Provide critical information, technical guidance, and maps to support local government's revisions to their Critical Areas Ordinances.	**PSAT, CTED, WDFW**		Puget Sound Plan, MFH-1

Objectives to be fulfilled (See Chapter 3)	**Through Habitat Alteration activities.**	**Lead Entity-** Cooperators	**Measurable Outcome**	**Major Program Linkage**
Sustain biodiversity	Hab 3: Provide outreach and educational materials on the Aquatic Habitat Guidelines.	**WDFW,** ECY, WSDOT, PSAT	Number of workshops.	Puget Sound Plan, MFH-2
Sustain biodiversity	Hab 4: Train local, state, and tribal staff on Aquatic Habitat Guidelines.	**WDFW**, ECY, PSAT, WSDOT	Number of staff trained.	Puget Sound Plan, MFH-2
Teach about connections	Hab 5: Continue to develop and disseminate educational materials in multi-media formats on the benefits and methods of riparian restoration.	**WDFW**, ECY, PSAT		Puget Sound Plan, MFH-2
Restore and maintain degraded ecosystems	Hab 6: Develop additional needed Aquatic Habitat Guidelines (e.g. stream crossings, marine shorelines protection, marine habitat restoration, treated wood, etc.)	**WDFW**, ECY, PSAT, WSDOT		
Restore and maintain degraded ecosystems	Hab 7: Continue to implement the Puget Sound Wetland Restoration Program.	**ECY,** PSAT	Acres of wetlands restored.	Puget Sound Plan, MFH
Sustain biodiversity	Hab 8: Develop wetland guidance documents based on the best available scientific information for use by local governments in developing wetland protection regulations under the GMA and the SMA.	**ECY**, PSAT, CTED		
Sustain biodiversity	Hab 9: Conduct wetland training workshops for local governments to assist them in implementing local wetland regulatory programs.	**ECY**	Number of workshops.	
Preserve natural ecosystems	Hab 10: Develop new guidance on wetland mitigation plans	**ECY**		
Focus funding	Hab 11: Develop a compliance tracking and enforcement program for agency permitted wetland mitigation projects.	**ECY**		
Preserve natural ecosystems	Hab 12: Prevent, control, and monitor the spread of aquatic nuisance species and increase the capacity of watershed groups to do the same.	**WSDA, ECY, WSU, Parks, WDFW, DNR, PSAT,**	Reduction in areas where nuisance species exist.	Salmon Strategy, Lan- 13 Puget Sound Plan, ANS-3
New Program Additions for 2005				
Support sustainable human communities	Hab 13: Provide technical assistance and education to support Shoreline Master Program updates.	**ECY, PSAT**		Puget Sound Plan, MFH-2
Teach about connections	Hab 14: Provide technical assistance to local governments on functions and processes of nearshore habitat.	**ECY, PSAT**		Puget Sound Plan, MFH-2

Objectives to be fulfilled (See Chapter 3)	**Through Habitat Alteration activities.**	**Lead Entity-** Cooperators	**Measurable Outcome**	**Major Program Linkage**
Restore and maintain degraded ecosystems	Hab 15: Develop a strategy to remove creosote logs from public and state beaches, wetlands, and parks.	**Parks**	Number of logs removed.	
Restore and maintain degraded ecosystems	Hab 16: Assess the impacts of nonpoint source pollution on nearshore marine vegetation with specific emphasis on the impacts of urban stormwater.	**DNR**, ECY, WDFW, PSAT	Acres of nearshore habitat loss.	Puget Sound Plan MFH-1.4
Preserve natural ecosystems	Hab 17: Find a volunteer watershed planning community to begin the task of identifying conservation targets for maintaining biological diversity within an aquatic ecological system.	**ECY,** CTED, WDFW, PSAT		
Restore and maintain degraded ecosystems	Hab 18: Provide WCC crews in each Ecology regions.	**ECY**		

Objectives to be fulfilled (See Chapter 3)	**Through these Educational Activities:**	**Lead Entity—** Cooperators	**Measurable Outcomes**	**Major Program Linkage**
Existing Programs				
Teach about connections	Ed 1: Organize a biennial conference on nonpoint pollution.	**WSU,** ECY	Number of participants.	
Teach about connections	Ed 2: Continue to develop, upgrade, enhance environmental learning centers across the state.	**Parks**		Puget Sound Plan, EPI-3
Teach about connections	Ed 3: Continue implementing PROJECT WET.	**ECY**	Number of students participating.	
Teach about connections	Ed 4: Continue implementing the Columbia Watershed Curriculum.	**ECY, WSU**	Number of students participating.	
Teach about connections	Ed 5: Continue to implement the Chehalis Basin Education and Consortium Water Quality Monitoring Program.	**ECY,WSU**	Number of students participating.	
Teach about connections	Ed 6: Introduce and support Master Watershed Steward Programs across the state.	**WSU**, ECY	Number of educational	

Objectives to be fulfilled (See Chapter 3)	**Through these Educational Activities:**	**Lead Entity—** Cooperators	**Measurable Outcomes**	**Major Program Linkage**
			events, participants and acres affected.	
Teach about connections	Ed 7: Develop and implement statewide training programs for the public and specific interest groups, such as real estate professionals, conservation district staff, planners, watershed group members, developers, and agriculture professionals.	**WSU, ECY,** WDFW, WSDOT, Parks	Number of educational events, participants and acres affected.	Salmon Strategy, Edu-6
Support sustainable human communities	Ed 8: Support existing community outreach programs to help reach TMDL goals.	**WSU, ECY**	Number of educational events, participants and acres affected.	
Teach about connections	Ed 9: Administer the PIE program for common objectives with the Puget Sound work plan.	**PSAT**	# of projects funded.	Puget Sound Plan EPI-1.5
New Program Additions for 2005				
Teach about connections	Ed 10: Develop water quality outreach programs to minority populations.	**ECY, PSAT**		Puget Sound Plan, EPI-1.5
Teach about connections	Ed 11: Develop and present water quality education in classrooms and events as requested.	**ECY,** WSU	Number of students.	
Teach about connections	Ed 12: Educate and engage the public in activities to correct and prevent nutrient pollution in Hood Canal.	**PSAT, WSU**	Number of educational events, participants and acres affected.	Puget Sound Plan, EPA-1
Focus funding	Ed 13: Support building local capacity for public education on water quality.	**PSAT, ECY, WSU**		Puget Sound Plan, EPI-1
Support sustainable human communities	Ed 14: Develop a water quality component for the continuing education program for local officials.	**CTED, ECY**, DNR, WSU, Parks	Number of workshops.	
Teach about connections	Ed 15: Implement Healthy Water/Healthy People curriculum.	**ECY,** WSU,	Number of students.	

Objectives to be fulfilled (See Chapter 3)	**Through these General Program Activities** *Programs that have multiple impacts or are administrative in nature*	**Lead Entity—** Cooperators	**Measurable Outcome**	**Program Linkage**
Existing Programs				
Preserve natural ecosystems	Gen 1: Continue to emphasize phase 1 and phase 2 lake planning efforts to control nonpoint source pollution.	**ECY**	Number of lakes protected.	
Support sustainable human communities	Gen 2: Continue to promote local watershed planning and implementation.	**ECY,** PSAT	Number of watershed-based plans supported under this plan.	Puget Sound Plan, WP-6
Restore and maintain degraded ecosystems	Gen 3: Continue to develop TMDLs and detailed implementation plans to address waters impacted by nonpoint source pollution.	**ECY**	Number of TMDLs developed.	Puget Sound Plan, NP
Restore and maintain degraded ecosystems	Gen 4: Develop and implement a statewide lakes management program addressing TMDLs.	**ECY**		
Restore and maintain degraded ecosystems	Gen 5: Continue to emphasize lake and watershed management planning to address nutrient and sediment enrichment, and de-emphasize the use of chemicals for pest control.	**ECY**	lbs of nutrients removed.	
Restore and maintain degraded ecosystems	Gen 6: Implement the Yakima River Sediment Reduction Plan.	**ECY**	Tons of sediment reduced.	
New Program Additions for 2005				
Support sustainable human communities	Gen 7: Create a toolbox for solutions to nonpoint source problems that includes grant project reports and products as well as agency products, and make the toolbox available on the internet.	**ECY**		
Support sustainable human communities	Gen 8: Develop clean water indicators for sustainable communities. Work with communities to forward their adoption.	**WSU, PSAT, ECY, CTED**		
Restore and maintain degraded habitats	Gen 9: Support local corrective actions and programs to reduce human-related pollution and nutrient input into Hood Canal to address the low dissolved oxygen problem.	**ECY, PSAT**	Number of corrective actions.	Puget Sound Plan 05-07 workplan priority 4
Restore and maintain degraded habitats	Gen 10: Develop a social marketing for clean water project for statewide application. Use the campaign to increase citizen's awareness of how their actions affect water quality and what they can do to improve water quality.	**ECY,** CTED		

Objectives to be fulfilled (See Chapter 3)	**Through these General Program Activities** *Programs that have multiple impacts or are administrative in nature*	**Lead Entity—** Cooperators	**Measurable Outcome**	**Program Linkage**
Shellfish Protection				
Restore and maintain degraded ecosystems	Gen 11: Continue to implement the shellfish closure response strategy.	**DOH,** ECY, PSAT	Acres of commercial shellfish beds with improved classifications.	Puget Sound Plan, SF-7
Focus funding	Gen 12 Automate nonpoint source data collection and reporting in shellfish growing areas.	**DOH**		
Shellfish Protection continued				
Restore and maintain degraded ecosystems	Gen 13: Conduct source identification monitoring in shellfish growing areas threatened or impaired by nonpoint source pollution.	**DOH**		Puget Sound Plan, SF-2
Preserve natural ecosystems	Gen 14: Provide guidance on land use measures to protect shellfish from impacts of urbanization.	**CTED,** DOH, PSAT		Puget Sound Plan, SF-2
Preserve natural ecosystems	Gen 15: Develop a model shellfish guidance that addresses nonpoint source pollution.	**CTED**, DOH		

Objectives to be fulfilled (See Chapter 3)	**Through Monitoring and Enforcement activities -** *Programs that monitor water quality or enforce water quality standards*	**Lead Entity--** Cooperators	**Measurable Outcome**	**Major Program Linkage**
Existing Programs				
Teach about connections	ME 1: Develop protocols for performing nonpoint source monitoring throughout Washington State.	**ECY**		
Focus funding on most effective strategies	ME 2: Monitor the effectiveness of corrective actions for nonpoint TMDLs, BMPs, and other watershed based plans.	**ECY**	Effectiveness of TMDLs, BMPs, and watershed based plans.	
Restore and maintain degraded systems	ME 3: Monitor nitrates and pesticide runoff from agricultural lands.	**WSDA**, ECY		
Restore and maintain degraded systems	ME 4: Continue developing TMDL technical reports.	**ECY**	Number of reports.	

Objectives to be fulfilled (See Chapter 3)	**Through Monitoring and Enforcement activities -** *Programs that monitor water quality or enforce water quality standards*	**Lead Entity--** Cooperators	**Measurable Outcome**	**Major Program Linkage**
Teach about connections	ME 5: Continue to implement ground water pesticide monitoring to support PMPs and ESA water quality and toxicological assessments.	**WSDA**		
Restore and maintain degraded systems	ME 6: Continue to monitor the implementation of forest practice rules statewide.	**DNR**, ECY, WDFW	Compliance monitoring report.	
New Program Additions for 2005				
Teach about connections	ME 7: Using existing monitoring data, identify water bodies high in phosphorus, nitrates, and sediments.	**ECY,** PSAT	List of water bodies.	
Teach about connections	ME 8: Report to the public on monitoring trends in Puget Sound through the Puget Sound Ambient Monitoring Program.	**PSAT**	List of reports issued and copies distributed.	Puget Sound Plan, M-1
Enforcement				
Restore and maintain degraded ecosystems	ME 9: Increase compliance and enforcement activities for nonpoint pollution sources.	**ECY**	Number of enforcement actions.	
Restore and maintain degraded ecosystems	ME 10: Investigate agricultural related complaints and assist in development and implementation of farm plans.	**ECY, CC**	Number of complaints attended.	

Chapter 6
Nonpoint Water Quality Monitoring

> *Waters, like soil, are part of the energy circuit. Industry, by polluting waters or obstructing them with dams, may exclude the plants and animals necessary to keep energy in circulation.* *Leopold, 1948*

As noted in chapter 5, each year, the state is asked to answer specific environmental questions about the effectiveness of its programs by a wide array of people and groups, including the legislature, governor, EPA, and the public. The questions vary depending on who is asking, for example:

1. What is the amount (in tons) reduction in nitrogen, phosphorus, and sediment in Washington's waters?—EPA
2. How many watersheds in the state that were polluted are now meeting water quality standards?—EPA
3. Are the management practices we're recommending effective—Forest Practices Board, industry groups, general public
4. What is the project outcome and was it worth the dollar value spent?—Joint Legislative Audit Review Committee

We ask similar questions of ourselves because we want to know whether the money and time we're spending on implementing best management practices and doing restoration projects is actually improving water quality, and to fine-tune the practices we use, if necessary.

These are a lot of important questions to answer, so Ecology's Water Quality and Environmental Assessment Programs are working with EPA to design an effectiveness monitoring strategy that can help us get the information we need to answer questions about program effectiveness and to help us keep improving our programs over time.

At this point, we are not sure what the strategy will look like, but we have some initial thoughts. Since we cannot monitor everything everywhere, we should be strategic about where we do monitor to ensure we answer the questions that are important to us. Some possible ideas to consider are:

- Does ambient monitoring help us answer our questions? If not, can we redesign that program so that it does?
- Should we test effectiveness in certain watersheds because the nonpoint problems we are trying to fix are particularly difficult to address?
- Should we compare results in two or more different watersheds where we have implemented the same array of practices, and suspect that the results will not be the same?
- Should we test the effectiveness of different arrays of practices?
- Should we test the effectiveness of an innovative practice?
- Should we compare the effectiveness of a single practice across two or more ecoregions?
- Should we test areas in which the state has spent a lot of money?

One initial idea is to assess the water quality trend in a set of representative watersheds in the state, and to try to figure out whether water quality is getting better or worse, and why. The watersheds selected would be primarily urban, agricultural, or forested, to assess trends for those three major kinds of land uses. While this is a question about water quality trends, we would also want to design a strategy that would give us information about why the trend is going the way it is, whether the trend is the same throughout the watershed and why or why not, and identify pollution sources that are still a problem and sources that have been controlled. This would lead us to other questions, like "are the BMPs we're using effective," and "are there sources of pollution that are not addressed by any of our best management practices?" We might also find out that the problem is not with the practices, but with the level of implementation.

However, the first thing we need to do is get clear about what kind of monitoring data will help us make management decisions and improve our programs. The conversations are continuing.

Chapter 7
Implementation Strategy

> *A land ethic, then, reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. Health is the capacity of the land for self-renewal. Conservation is our effort to understand and preserve this capacity.* *Leopold, 1948*

This plan's strategy includes implementation activities in two broad categories: The first are those programs that are currently being implemented in the state by local governments, tribes, and special purpose districts. This plan assumes that all existing federal, state, and local programs to control nonpoint source pollution will continue, at least for the term of this plan, which is five years. These programs are described in Volume 1 of the nonpoint plan, *Water Quality Summaries for Watersheds in Washington State*.

The second category includes all the existing programs identified in Volume 2 of the nonpoint plan, *Existing State Programs and Management Measures to Control Nonpoint Source Pollution in Washington State*. These are the programs currently being implemented by state agencies. In addition, Table 5.1 identifies specific activities and new program additions that state agencies will attempt to fund and staff.

What is the strategy to implement nonpoint plan activities, and how will those activities be funded?

Implementation Strategy for Local Governments

Volume I of the nonpoint plan provides a series of summaries that profile each major watershed in Washington State. The information contained in these watershed summaries can be used to better understand the relationships between demographics, land-use activities, and water quality problem areas. Data from the summaries can be used to help support water quality and watershed-based planning efforts. Subsequently, those local plans that are incorporated into Volume I will be adopted by reference as part of Washington State's overall water quality plan.

Once adopted by reference, a plan of action or implementation activity becomes eligible to receive funding from the Department of Ecology's Water Quality grants program. However, the same eligibility criteria do not hold true, yet, with other grant programs.

A sampling of grant and loan programs that are available to local governments to help implement the nonpoint plan are listed below.

Grants and Loans
Many **federal** agencies provide grants to locals to implement activities for water quality protection. Some of these include (not a complete list):

U.S. Department of Agriculture
- Conservation Reserve Program
- Conservation Reserve Enhancement Program
- Environmental Quality Incentives Program

Wetland Reserve Program
Forestry Incentives Program
Water and Waste Direct Loans and Grants

Department of Commerce
- NOAA Community Based Restoration Program

U.S. Environmental Protection Agency
- Watershed Assistance Grants
- Wetland Assistance Grants
- Pollution Prevention Incentives to States
- Environmental Education
- Tribal Programs

Bonneville Power Administration
- Fish and Wildlife Program

U.S. Army Corps of Engineers
- Water Resource Assistance Programs

Many **state** agencies provide grants, loans, and technical assistance to local governments to implement activities for water quality protection. Some of these include (not a complete list):

Washington State Department of Ecology
- Centennial Clean Water Fund
- Section 319 Nonpoint Source Grants
- State Revolving Loan Fund
- Coastal Zone Management Grants
- Aquatic Weeds Financial Assistance
- Washington Watershed Planning Grants

Washington State Department of Natural Resources
- Forest Riparian Easement Program
- Aquatic Lands Enhancement Program
- Urban and Community Forestry Program
- Family Forest Fish Passage Program

Washington State Department of Fish and Wildlife
- Regional Fisheries Enhancement Group Program

Washington State Office of Community Trade and Economic Development
- Growth Management Program Grants
- General Purpose Block Grants
- Community Development Block Grants
- Coastal Loan Fund

Washington State Department of Transportation
- Transportation Enhancement Program (TEA-21)
- City Fish Passage Barrier, Stormwater, and Habitat Restoration Grants

Interagency Committee for Outdoor Recreation
- Salmon Recovery Funding

Puget Sound Action Team
- Public Involvement and Education Fund (PIE)

Washington State Conservation Commission
- Dairy Nutrient Management Grants
- Water Quality Implementation Grants
- Irrigation Efficiencies Grant Program

Grants to businesses, individuals, and non-profit organizations, as opposed to public entities, are limited by both the state constitution and various statutes. However, in addition to those listed above, there are a number of private funding sources that local groups can use to help fund water quality programs.

Technical Assistance
State agencies provide technical assistance to local governments, tribes, and to each other in the implementation of environmental programs. Many agencies have extensive programs that provide in-kind technical assistance. In some cases, they must provide technical assistance before taking an enforcement action.

Enforcement
Washington has actively sought delegation to implement federal programs and legislation from the federal government in an effort to maintain state control of resource management concerns. Examples include the federal Clean Water and Safe Drinking Water Acts. Enforcement is used by several agencies and by local governments to ensure compliance with water quality regulations. Though many programs rely initially on working with people to encourage cooperation, the regulatory support is needed for polluters whose compliance cannot be achieved any other way.

Implementation Strategy for State Agencies

This document, Volume III of the nonpoint plan, contains the management strategies to implement major programs designed to fulfill the goals and objectives outlined in Chapter 3. Table 5.1 of this document is the state agency list of activities. It is derived from both the ongoing activities within each agency and the site-specific need identified through the annual planning meeting of the state agency nonpoint workgroup.

Once an activity is adopted into the annually updated Table 5.1, it is up to each agency to find funding, if none has been previously available, and to implement and report on the activity. How do state agencies find funding for plan activities? The two most obvious ways are to request appropriations from our state legislature and through federal grants.

Washington receives most of its revenue from taxes, licenses, permits and fees, and federal grants. Each individual revenue source is designated by law for deposit into specific accounts used to support state operating or capital expenditures. State agencies are responsible for developing budget estimates and submitting budget proposals to the governor. Once the budget is enacted by the legislature, agencies implement approved policies and programs within the budgetary limits imposed by legislation.

Washington enacts budgets for a two-year cycle, beginning on July 1 of each odd-numbered year. The budget approved for the 2003-05 Biennium remains in effect from July 1, 2003 through June 30, 2005. By law, the governor must propose a biennial budget in December, the month before the legislature convenes in regular session. The biennial budget enacted by the legislature can be modified in any legislative session through changes to the original appropriations.

State General Fund

The *general fund* represents all financial resources and transactions not required by law to be accounted for in other accounts. *General Fund-State* (GF-S) refers to the basic account that receives revenue from Washington's sales, property, business and occupation, and other general taxes and that is spent for operations such as public schools, social services, and corrections[23].

Federal Grants

States receive a variety of federal grants. As an example, Washington State Department of Ecology receives:

> EPA's 319(h) Nonpoint Source Grant – Clean Water Act Section 319 requires states to control nonpoint source pollution. 319 funds help pay for the development of this plan.
>
> Performance Partnership Grant (PPG) – An agreement with EPA funds parts of Ecology's work with surface water, ground water, and underground injections control.
>
> Coastal Zone Management Grant -- Under NOAA's Coastal Zone Management Plan, this helps fund Ecology's work with agriculture, forestry, wetlands, and other issues within Washington State's coastal zone.

Each state agency receives federal grants to implement a variety of programs. These grants usually give recipients flexibility to develop their own program as long as it matches grant requirements. Thus, these grants can be used to implement nonpoint programs, but it depends upon the agency to develop a specific workplan element in the grant that is dedicated to an action identified in this plan.

Direct Implement Fund

Through its Enhanced Benefit Status, Ecology has developed the Direct Implementation Fund (DIF). This fund is available to state agencies only for projects that would assist in implementing program development projects clearly described in the work plans and which implement actions identified in Table 5.1 of the nonpoint plan. Activities must be beyond the current responsibilities of the agency as mandated by our legislature. State agencies submit applications for activities for which they are designated as lead in the plan. Projects are identified and prioritized by the State Agency Nonpoint Workgroup.

Progress Review

Progress toward meeting the goals and objectives of the plan will be evaluated and discussed by the State Agency Workgroup each fall. Members of this workgroup have access to their agencies' data, programs, and activities at the local level. They will work closely to align activities and support each other in the broader direction of plan activities.

Five Years from Now

The actions identified in the plan will require a long-term commitment from federal, tribal, state, local, and private resources. There is no quick fix to pollution that is as endemic as nonpoint pollution. Although the scope of this plan covers actions to be taken within five years, the framework and efforts established in the plan will continue for many more years. During the five years of this plan, the focus of many agencies will be to develop the necessary programs to implement the actions in the plan. Each agency will determine its own timeline for the actions, and report the timeline to the State Agency Workgroup. Ecology will track these timelines and project completion for the workgroup. The workgroup will also coordinate the timing of inter-related actions.

As programs are developed, they will be implemented on the ground by the appropriate groups, as needed. For example, landowners will put in place BMPs, agencies will provide technical and financial assistance when possible.

In addition, the various planning processes such as TMDLs, local watershed plans under chapter 90.82 RCW, salmon recovery limiting analyses under the Salmon Recovery Act, and Puget Sound Watershed Plans under chapter 400-12 WAC (or their equivalent outside the Puget Sound area) will continue to investigate and identify water quality problems across the state. This plan will provide a toolbox of programs to be used in these areas to address the identified problem.

In summary, during the next five years of this plan, agencies will develop the programs necessary to implement the actions identified in the plan, and implement where possible. Beyond five years, programs will be implemented to the maximum extent needed and where possible within the state, and additional programs will be developed and implemented to manage future identified needs. Every five years this plan will be updated, including another analysis of management measures. The need for major changes in strategy will be identified at that time. We will again use a coordinated approach for the update.

Washington's Water Quality Plan to Control Nonpoint Source Pollution is a living document. The actions of the plan, when taken as a whole, will focus resources in a manner that widens program implementation, improves program effectiveness, and attends to problems not previously addressed. Through increased coordination and cooperation, we can improve the quality of the state's waters, and maintain and improve our quality of life.

References

Executive Summary

[1] Leopold, Aldo, "The Land Ethic" in, *A Sand County Almanac, and sketches here and there.* First published in 1949 by Oxford University Press, Inc., New York, New York

Chapter 1

[2] Forecast of the State Population, November 2003 Forecast. Office of Financial Management, Forecasting Division. November 2003.

[3] County and city population totals can be obtained from the Washington State Office of Financial Management, http://www.ofm.wa.gov/popden/index.htm.

[4] **http://www.ecy.wa.gov/programs/wq/303d/2002/2002-index.html**

Chapter 2

[5] *Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution, Volume 1: Water Quality Summaries for Watersheds in Washington State*. Publication Number 04-10-063. William Hashim and Lauren Stalmaster.

[6] Washington Forest Protection Association, FYI, 2003.

[7] 2002 Census of Agriculture, USDA National Agricultural Statistics Service, June 2004

[8] Woodward-Clyde, BMP Design Recommendations, November 1995

[9] (Booth, Hartley, and Jackson, 2002, JAWRA, Vol. 38, No. 3).

[10] *An Assessment of Outdoor Recreation in Washington State*, IAC, 2002

[11] *An Assessment of Outdoor Recreation in Washington State*, IAC, Oct. 2002

[12] *The Marina Industry in Washington State: Growth and Change, 1981-2000,* Robert F. Goodwin, April 1991. Sea Grant publication WSG-AS 91-06

[13] Dahl, T.E. 1990. *Wetland Losses in the United States 1780's to 1980's*

[14] Washington State Department of Natural Resources, 1998. *Our Changing Nature: Natural Resource Trends in Washington State.* Olympia, WA.

[15] National Research Council. 1995. *Wetlands: Characteristics and Boundaries.* Washington, DC: Water Science and Technology Board, Commission on Geosciences, Environment and Resources, National Academy Press.

[16] U.S. Environmental Protection Agency. 2002. *Wetland Loss Index, 1780s to 1990s.* Available: http://www.epa.gov/iwi/1999sept/iv7_usmap.html. Accessed December 17, 2002**.**

[17] *Puget Sound Water Quality Management Plan, 1994*. Puget Sound Water Quality Authority. May 18th, 1994.

Chapter 3

[18] Department of Energy, 2004
http://www.sustainable.doe.gov/overview/ovintro.shtml

[19] John Marzluff, Associate Professor, University of Washington, in *Washington Biodiversity Conservation Strategy*, Report to the Legislature, October 1, 2003

[20] Issues in Ecology, Number 2, spring 1997 "Ecosystem Services: Benefits Supplied to Human Societies by Natural Ecosystems.

Chapter 4

[21] *Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution, Volume 1: Water Quality Summaries for Watersheds in Washington State*. Publication Number 04-10-063. William Hashim and Lauren Stalmaster.

Chapter 5

[22] State of Washington, Joint Legislative Audit and Review Committee. Investing in the Environment: Environmental Quality Grant and Loan Programs Performance Audit. Report 01-1. January 22, 2001.

Chapter 7

[23] *Washington State Budget Process*, Office of Financial Management, Budget Division, April 2004

Appendix 1
Response to comments received on the public review draft

EPA Comments

1. It would be helpful for the plan to describe, upfront, the overall purpose of the update, and the review process which was undertaken to update the previous plan, including factors considered. Changes in circumstances since the last plan may lead to shifts in priorities and goals and planned activities.

Response: We clarified in the executive summary and Chapter 1 the reason for the update and the lessons learned that allowed us to make the changes we did.

2. For the plan update, the nine key elements (which were used as the basis for approval of the upgraded NPS plan) should be reviewed to determine their relationships to the plan's short and long-term goals, and implementation measures. Progress in attaining goals under the existing program, through the stated implementation measures, should be reviewed and necessary modifications to goals and measures made as necessary, in order to better respond to the key elements. It would be useful to briefly describe the above review "process" (how the nine keys elements were reviewed to assess the need for program changes) in the update, and under each element, what changes, if any, were incorporated into the update to better respond to a particular element.

Response: As we did in the 2000 plan, the nine key elements were used as a checklist to make sure we covered the essential elements of a comprehensive nonpoint plan.

3. Under "Table 5.1 Actions to Manage Nonpoint Pollution in Washington State (2005-2010)"; objectives should be reviewed to ensure they tie into specific measurable environmental outcomes and results. Some outcomes have not yet been included in the table. Outcomes should be checked to make sure they are consistent with nonpoint source program targets relating to water quality improvements, de-listings, load reductions, and watershed-based planning. Outcomes will provide the basis for reporting program progress and results.

Response: We agree and have made changes and additions to Table 5.1. Some actions do not have measurable environmental outcomes because they are the first step in a series of actions that we believe will ultimately lead to water quality improvements. We have been careful not to claim that an activity will have a measurable result if we do not believe the result will be measurable for several years in the future. This is one of the challenges of working to solve nonpoint pollution problems—much of our work today is laying the groundwork for significant and lasting water quality improvement, but in most cases we could not justify that work today by showing quantitative water quality improvements now.

4. The plan (through objectives, outcomes) should indicate how watershed-based planning would be employed to direct resources to priority water quality problems and on-ground implementation projects. Effectiveness monitoring would be conducted to report progress against stated water quality objectives.

Response: Washington's primary method of using watershed-based planning to target resources to priority problems is through Ecology's TMDL program. We address 303(d) listings systematically, watershed by watershed, by developing TMDLs; producing detailed implementation plans, which are one of Washington's watershed-based plans to specifically address water quality; and by focusing resources to implement those plans and to evaluate the effectiveness of implementation. As always, our challenge is to use our limited funds most effectively, and to strike a balance between the need to produce TMDLs, to implement them, and to test their effectiveness.

Olympia Workshop – 3/8/2005

1. Start creating relationships with trade unions, master builders, lawn and landscape companies, automobile shops, community colleges, and other local groups to help control nonpoint source pollution.

Response: Great idea. We are considering creating a nonpoint workgroup made up of the groups listed in the comment plus other interested groups. Many of these relationships are already forged because of our work on specific projects or within specific watersheds. TMDL implementation in many watersheds is being led by groups like these and other community-based citizen groups.

2. Increase compliance and enforcement support for local governments.

Response: We agree that enforcement and compliance support are good tools to help local governments control nonpoint pollution. In general, Ecology's approach is to work with people first to see if pollution problems can be remedied before going to enforcement.

3. The plan needs to do a better job of addressing vessels and boat live-aboards, ORV dump stations, and other potential recreational sources of nonpoint source pollution.

Response: We will work more closely with the Parks and Recreation Commission and the Interagency Committee for Outdoor Recreation to start doing a better job of addressing recreational activities.

Spokane Workshop 3/9/2005

1. More enforcement is needed in order to control nonpoint source pollution

Response: We agree and we do have authority to conduct enforcement for nonpoint sources of pollution. However, as noted above, our approach is to work with people first to see if we can address pollution problems before moving to enforcement.

2. Create a way to place Ecology staff in communities so they are on the spot to work with us.

Response: In addition to the four regional offices, Ecology has field offices in Bellingham, Vancouver, and Kennewick. Staff is also stationed in Twisp and Walla Walla.

Ellensburg Workshop 3/10/2005

1. Consider using BMPs that are science based and peer reviewed. Make sure they are both cost effective and can get the job done.

Response: The agricultural and riparian restoration BMPs that we recommend or fund have been thoroughly researched and are known to be effective. These BMPs include those in the Natural Resource Conservation Service's Field Office Technical Guide, WSU's set of published BMPs, Washington State's Aquatic Habitat Guidelines, and the National Oceanic and Atmospheric Administration's (NOAA's) set of nonpoint management measures. These are all science based and peer reviewed.

2. Include natural conditions as a source of nonpoint pollution.

Response: Natural conditions are not a "source" of nonpoint pollution. According to the state water quality standards, the term "natural conditions" describes the surface water quality that was present before any human-caused pollution. Ecology considers the natural condition issue when preparing the Integrated Water Quality Assessment (also known as the 303(d) list) and when developing a Total Maximum Daily Load. However, only wilderness areas or other areas with no significant human impacts can be assumed to represent natural conditions. In areas that have been altered by human activities, our strategy is to control human-caused sources of pollution.

Jack Field
Executive Vice President
Washington Cattlemen's Association

Comments Regarding: Washington State Department of Ecology's – Nonpoint Source Pollution Control Plan

1. Why are private landowners not represented on the non-point working group?

Response: The nonpoint workgroup referred to is the Washington State Agency Nonpoint Workgroup. It was created as a way for state agencies to work together to address nonpoint pollution. Private landowners are represented on many other groups working on nonpoint pollution issues, most commonly on local watershed planning groups or groups developing and implementing TMDLs.

2. In the Executive Summary, it needs to be stated that this is an opinion paper that is not based on science and has not been peer reviewed.

Response: We disagree. This is not an opinion piece. The nonpoint plan is based on the best available science on practices and most current information on strategies we could get. It was peer reviewed by federal and state agencies before it became available to the public. The purpose of the plan is to describe the state's strategies to control nonpoint pollution. Because nonpoint pollution is generated by all sorts of activities, addressing it requires partnerships at all levels of government and society.

3. There needs to be a peer reviewed study developed to determine a baseline so implemented practices can be measured to determine the effectiveness of the plan.

Response: The Department of Ecology performs several kinds of monitoring that provide information about the effectiveness of BMP implementation. The agency will continue to refine its monitoring strategy because we believe it is critical to document successes and to answer questions about which management practices are most effective, whether some combinations of practices work better than others, and other questions that will help us fine tune our nonpoint strategy.

4. Page 4 "What is the Quality of Washington State's Water?" Why are Reservations exempt from this plan? Nonpoint source pollution does not recognize tribal boundaries; Washington State should not exclude the tribes from the jurisdiction of this plan.

Response: Federally-recognized tribes are sovereign nations and the state has does not have jurisdiction over those lands. However, the Environmental Protection Agency works closely with tribes to address pollution problems on tribal lands. Some tribes have adopted their own water quality standards, which, in some cases, are more stringent than state standards. Many tribes work cooperatively with the state to assess water quality on their lands and to address pollution problems.

5. Was figure 1.5 the Water Quality Index Status of Washington State Waters peer reviewed by third party scientists?

Response: The Water Quality Index is produced by the Department of Ecology's Environmental Assessment Program. Its methodology was peer reviewed by a variety of scientists and water quality experts. The initial report can be found at http://www.ecy.wa.gov/biblio/0203052.html.

6. Page 8. DOE needs to separate point source pollution, i.e., CAFO from nonpoint, i.e., grazing The generality that there is a problem with grazing is adequately justified in this document. Thus DOE should not use broad brush generalities towards livestock grazing.

Response: CAFOs, or concentrated animal feeding operations, are a specific type of agricultural operation that EPA has designated a point source of pollution. Other kinds of agricultural practices have not been designated as point sources, although they may also cause water pollution problems. The plan does not state that there is a particular problem with grazing. Rather, it points out that many kinds of activities can contribute pollution if improperly implemented. The focus of the nonpoint plan is to outline those activities that can help to prevent nonpoint pollution or to address existing pollution problems caused by different kinds of land uses, including agriculture. The fact that grazing has not been designated as a point source does not mean that grazing cannot cause water quality problems. Grazing may or may not cause a problem, depending on whether appropriate management practices are used.

7. The document sites urban uses as a potential problem but does not address septic tanks as a source of pollution.

Response: We added a section in Urban/Rural Areas on the problems of septic tanks. The Departments of Ecology and Health are presently working on updating the state's rules for on-site septic systems.

8. Page 9. DOE needs to consider the potential impacts their decisions have on the economy.

Response: The Administrative Procedures Act requires all state agencies to consider economic impacts as a part of rule making and permit development. The nonpoint plan is designed to help people avoid polluting waters of the state and to comply with the state water quality standards. The economic impacts of the state water quality standards were evaluated at the time standards were adopted.

9. Page 15 -- Livestock Producers must keep animals out of surface water. NO they do not. Washington State Law grants livestock the **right** to drink directly therefrom. **RCW 90.22.040 Stockwatering requirements.**

Response: RCW 90.22.040 requires the state to retain sufficient minimum flows or levels in streams, lakes or other public waters to provide adequate waters in such water sources to satisfy stockwatering requirements for stock on riparian grazing lands that drink directly therefrom where such retention shall not result in an unconscionable waste of public waters. This RCW is

about maintaining adequate water for stockwatering, but does not grant a right to pollute waters of the state. In 1994, Ecology developed Policy # 1025, "Policy for conveying stockwater away from streams to protect water quality," to address the riparian water rights issue. This policy states, "The Department of Ecology recognizes that removing livestock from streams will protect water quality and improve vegetative zones associated with stream banks. The change of water right process (90.03.380 RCW) will not be required when small amounts of water consistent with historic practice are diverted (screened and piped) to nearby stockwater tanks for consumption by livestock." Holding a riparian water right does not bestow a right to pollute waters of the state.

10. Page 16 -- The document sites 55% of impaired waters occurring as a result of riparian corridor degradation. How was this figure derived and where are the supporting documents? Fecal Coliform was sited as a source of pollution; did the DOE perform DNA tests on the water to determine the origin of the fecal coliform? If not the DOE can not say the fecal coliform is all from grazing livestock. Wildlife produces large quantities of fecal coliform as well.

Response: The original 55% figure was derived from the state's 1998 305(b) report. Because the 55% figure was an issue with a couple of commenters, we took that figure out of the document and replaced it with a table showing, nationwide, the leading sources of water quality impairments. That figure was identified in the National Water Quality Inventory 1998 report to congress, EPA publication, June 2000.

11. Page 16 cont. -- Management is the key, managed grazing can occur throughout the year in riparian corridors without causing harm.

Response: The Natural Resources Field Office Technical Guide for Washington contains two practices that address this issue, 390, Riparian Herbaceous Cover, and 391, Riparian Forest Buffer. Both of these stipulate that livestock must be controlled or excluded until the desired plant community is well established and that grazing must be limited or livestock excluded as necessary to protect emerging vegetation and maintain streambank stability.

12. Page 25. Diversion of water for off site stockwatering. How can this occur without impairing existing rights? What about stockwatering?

Response: See response to comment #9.

13. Page 47. What are the goals of the plan? They need to be defined without a clear definition of the end goal there will be no way of ever completing any plan.

Response: The plan goal and objectives can be found on page 31. The goal of this water quality plan is to:

> *Protect and restore water quality by creating a culture in Washington State that values ecosystem health and biodiversity.*

The plan objectives that will help us achieve this goal are:

- *Restore and maintain degraded systems/habitats*
- *Support sustainable human communities*
- *Sustain biodiversity*

- *Preserve natural ecosystems*
- *Focus funding on most effective strategies*
- *Teach about connections between individual actions and clean water*

14. Page 69 sites the requirement of a long-term commitment with federal, tribal, state, local, and private resources. However, page 4 exempts the tribes from compliance with this plan. Why?

Response: Language on page 4 does not exempt tribes; this is a plan of action to reduce nonpoint source pollution. What the language on page 4 does is recognize the sovereign nation status of tribal lands. Also, see response to comment #4.

Edie Gilliss
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1. I am glad to see that the Washington State Department of Ecology is moving forward with a plan that aims to clean up our waterways in Washington, but it is my belief that the Management Plan, as written, does not go far enough in protecting our rivers, streams, and the Sound. Over 70 Washington waterways have unsafe levels of chemicals that don't break down and build up in the food chain – chemicals like PCBs, lead, mercury, and dioxin. It is still legal to discharge these chemicals directly into Puget Sound—and dioxin, which is typically found in fertilizers, is a major source of non-point pollution that is not currently being addressed in your plan.

Response: Ecology is presently working on toxic chemicals through its TMDL program and through development of a persistent bioaccumulative toxics (PBT) rule. Ecology and EPA have produced or are working on TMDLs to address toxic chemicals in the Snohomish, Similkameen, Walla Walla, and mid Columbia Rivers and in Bellingham Bay. In addition, Ecology's Environmental Assessment Program performs special verification studies for waters listed for toxic chemicals on the 303(d) list prior to beginning work on a toxic TMDL. Many of these verification studies have shown that toxic chemicals found in the water were single incidents or may have been remedied through permits or other water quality improvement work. In the 2004 legislative session, Ecology was directed to establish, through rule, specific criteria for use in identifying PBTs that pose human health or environmental impacts in Washington and a clear process for developing chemical action plans to address those impacts. The draft rule has been released for public comment, and the rule is expected to be final in fall of 2005. For more information on the draft rule and Ecology's other work on toxic pollutants, please see the Ecology PBT strategy website at http://www.ecy.wa.gov/programs/eap/pbt/pbtfaq.html

2. The most recent National Water Quality Inventory reports that agricultural nonpoint source pollution is the leading source of water quality impacts to surveyed rivers and lakes, the third largest source of impairments to surveyed estuaries, and also a major contributor to ground water contamination and wetlands degradation.

Response: We added a table from the National Water Quality Inventory that emphasizes these points.

3. Congress amended the Clean Water Act (CWA) in 1987 to establish the section 319 Nonpoint Source Management Program because it recognized the need for greater federal leadership to help focus State and local nonpoint source efforts. Under section 319, State, Territories, and Indian Tribes receive grant money which support a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects. It is my hope that Washington State Department of Ecology use these broadly outlined directives to formulate a plan that includes addressing dioxin specifically.

The Puget Sound action Team's State of the Sound 2004 report (http://www.psat.wa.gov/Publications /Publications.htm) identifies polluted stormwater as a leading source of pollution in this region. Despite ample evidence that many fertilizers are contaminated with dioxin, at levels many times above cleanup level for Superfund sites, Washington State has never limited, prevented, or required testing for dioxins in fertilizer. And so I would like to urge the Department of Ecology, in addition to the programs listed in Table 5.1 of your report: "Actions to Manage Nonpoint Pollution Washington State," to:

- Develop Programs aimed directly at banning dioxin in fertilizers
- Establish programs to monitor levels of PCBs, lead mercury, and dioxin in humans, fish, marine mammals, and sediments.

These contaminants are known to cause cancer, reproductive and developmental toxicity and other serious health effects. Lead, mercury, and dioxin are known to accumulate in the fatty tissues of animals and humans, and can be passed from mother to child through breastfeeding. It is my belief that, until we address banning these toxic fertilizer additives, the WA Water Quality Management Plan for Nonpoint Pollution will not be complete.

Response: Currently Ecology is addressing the above pollutants through the PBT rule. The draft PBT rule lists dioxins as one of the categories of chemicals for which a chemical action plan would be required. The rule also lists lead, mercury, and PCBs. While we cannot predict what those chemical action plans will look like now, it may well be that they will include monitoring levels of toxic chemicals in sediments and animal tissues. Ecology's toxics verification studies already include monitoring in sediments and fish tissues, since many toxic chemicals are difficult to detect in the water column, while they accumulate in sediments and tissues. As mentioned above, Ecology and EPA have developed TMDLs for toxic chemicals in several water bodies in the state.

Urban stormwater also contains toxic chemicals, which come from a variety of sources, including pharmaceuticals and household chemicals. Dioxin in urban stormwater comes primarily from automobiles, with a significant contribution from backyard burning barrels.

In 1998, Ecology and the Department of Health monitored 50 fertilizer products, including home-use fertilizers, agricultural micronutrient products, and a soil amendment, for dioxin. Most fertilizer products had non-detectable or extremely low levels of dioxin. Two products had high amounts. These products were zinc fertilizers made with steel mill flue dust. This source of

zinc is no longer used. As a result of this study, EPA established a federal dioxin standard for fertilizer.

In addition to this study, Ecology also sampled for dioxin in soils. Soil samples were collected from urban, open, forested, and agricultural lands. Testing showed that dioxins are found in surface soils throughout Washington with values ranging from 0.033 to 19 parts per trillion. All samples had detectable levels of dioxin, including samples from remote wilderness areas. In general, average dioxin levels appear to be higher in urban areas than in forested or open areas. This was expected, since the primary source of dioxins is from combustion processes. Dioxin levels in agricultural soils were lower than those in the other three areas. It is unclear why this is so. Possible factors include distance from urban sources of dioxin and differences in land use practices, including tilling, which may dilute surface dioxin concentrations.

Copies of the dioxin studies may be found at http://www.ecy.wa.gov/biblio/99309.html and http://www.ecy.wa.gov/biblio/99333.html

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Harriet Beale, Acting Director of Programs
Puget Sound Action Team

1. Chapter 2 – Section: Urban and Rural Growth – Background - Page 19

PSAT has now published the *Low Impact Development Technical Guidance Manual for Puget Sound* (January 2005). Please update the statement regarding the use of 319 funds for this purpose and include access to the online version at http://www.psat.wa.gov/Publications/LID_tech_manual05/lid_index.htm

Cumulative Impacts for Nonpoint Sources of Pollution - Table 2.2 – page 28
We recommend that a column be added for the sources of metals, in particular because it is included in the Water Quality Index described on page 5. The primary source is stormwater. The Action Team has concerns about toxic substances carried by stormwater as they may affect water quality and sediment hot spots.

Response: Column inserted.

2. Chapter 3 - Objective 3: Sustain biodiversity - page 32

The comprehensive review of the state's needs for biodiversity data and conservation resulted in the formation of the Washington Biodiversity Council with members appointed by the Governor. The council is charged with formulating a 30-year prioritized strategy to protect and recover the state's biodiversity.

Response: Language about the Biodiversity Council has been inserted into the plan.

3. How Will We Achieve These Objectives – page 34

Innovative Approaches – It is unclear what is meant by "small town stormwater alternatives." We recommend that "low impact stormwater alternatives" be included as an innovative approach in urban, small town, and rural settings.

Response: Change made.

4. Environmental Education – We suggest that public involvement be added to this section as a component of community environmental education. The PSAT Public Involvement and Education (PIE) program funds projects for community members to educate and involve others in their communities, an approach that differs slightly from teaching the public, and one that has been successful in generating sustainable local activities.

Response. Comment inserted.

5. Chapter 5: Activities and Milestones – Outcome Performance Measures – Page 47

We suggest an update to this section refer to the Government Management and Accountability Program (GMAP) currently being initiated under Executive Order 05-02 by Governor Gregoire. While the GMAP program may not affect the performance measures in the nonpoint pollution plan, it is a significant cross-agency effort to improve the use of performance measures by the state. The outcome measures added to the nonpoint pollution program are a step in the same direction.

Response: Since GMAP has just been initiated in Washington State, we felt that referencing it into the nonpoint plan would be premature. We will keep an eye on the initiative and discuss with the nonpoint workgroup how to apply GMAP to the nonpoint effort.

6. Additionally, the *2005-2007 Puget Sound Conservation and Recovery Plan,* a biennial work plan for the Puget Sound Action Team Partnership, includes measurable results for a number of agencies that relate to preventing or reducing nonpoint pollution. PSAT staff is available to coordinate with Ecology to align measures and reporting periods so as to increase interagency efficiency and focus on results for the highest priority actions.

Response: Comment noted.

7. Table 4.2 Matrix of Agency Nonpoint Responsibilities

We recommend the following changes for the descriptions of PSAT responsibilities:
Agriculture: PS Plan addresses ag nps pollution through watershed planning and implementation and the Agricultural Practices, and in the biennial PS work plan that helps fund pesticide education and farm planning activities.
Forest Practices: PS Plan addresses forest practices and local watershed planning and implementation.

Urban/Rural Growth: Maintains and updates policies for on-site sewage, shellfish and stormwater planning in Puget Sound, facilitates tech assistance to locals, regional work to promote low impact development, funds education projects.

Recreation: PS Plan addresses boater/marina issues, biennial work plan includes funding for boater education.

Habitat Alteration: PS Plan and biennial work plan to coordinate policies and science on habitat protection and restoration; funds education projects for shoreline owners and others; develop and implement nearshore science in protection and restoration.

Other activities: Through PS Plan and biennial work plan coordinates state, federal, tribal agencies and others for conservation and recovery in Puget Sound; funds community education; helps coordinate Hood Canal cleanup efforts; reporting on status water quality, habitat and species recovery for Puget Sound.

Response: All changes made.

8. Table 5.1 Actions to Manage Nonpoint Pollution in Washington State (2005-2010)

This letter includes in Attachment 1 PSAT recommendations for changes to Table 5.1. Some of the changes reflect addition or deletion of the PSAT staff as Lead Entity or Cooperator, others include measurable outcomes that align with outcomes PSAT and/or other agencies have committed to in the 2005-2007 *Puget Sound Conservation and Recovery Plan* (work plan), and there are several additions as Major Program Linkages to the *Puget Sound Water Quality Management Plan.*

Response: All comments in the attachment were inserted.

March 15, 2005

DNR's comments on Draft ***Washington's Water Quality Management Plan to Control Nonpoint Source Pollution***, Volume 3 – Management Strategies - January 2005

Carol Walters
DNR's Representative on the Nonpoint Workgroup

1. **Page 7** – The Way We Use the Land
Need a date context when talking about "new" forest practices rules and "old" forest practices rules. The most current permanent forest practices rules based on the recommendations in the Forests and Fish Report were effective July 2001.

Response: Change made.

2. Page 8 – Change title, "The *Problems with* Land Use Practices" to "The *Impacts of* Land Use Practices." The land use practice itself may not be a problem, but when it impacts water quality it becomes one.

Response: Title was changed.

3. **Page 7** – The Way We Use the Land. Last sentence – what "intended goals" are being referred to? "objectives of the Forests and Fish Report" may be more accurate here. Appendix L (Adaptive Management) of the FFR, subsection (c) refers to the importance of adequate compliance monitoring.

Response: Suggested correction made.

4. **Page 11** –"parcels greater than 20 acre." If you decide to keep this wording, it needs more explanation. Forest landowners are exempt from the RMAP requirements if they own 80 acres or less in Washington and are submitting a forest practice application or notification for a block of forest land that is 20 contiguous acres or less. While the landowners are exempt from the RMAP requirements, they still must, of course, comply with the road construction and maintenance forest practices rules (Chapter 222-24 WAC).

Response: This explanation inserted.

5. Page 26 – Water Quality Impacts from Loss of Aquatic Ecosystems
The term "deforestation" is misleading in this context. It implies that trees have not been replanted on previously harvested forestlands. Reforestation is required under WAC 222-34-010 and WAC 222-34-020, regardless of where the harvest takes place, i.e., upper watersheds, foothills, lowlands, etc.

Deforestation does occur on lands where forestland is being converted to another use incompatible with timber growing, i.e., development for housing tracts, grazing, pastureland, etc. These forest practices are known as Class IV General forest practices and are subject to WAC 222-20-050 – which states that if conversion is not initiated within 3 years after the harvest is completed, then the reforestation requirements (listed above) shall apply and reforestation shall be completed within one addition year.

Response: Term changed to forest practices.

6. Page 33 – 5. Focus funding on the most effective strategies. Please consider the following language:

"However, financial managers at both the state and federal levels are getting impatient for the state to show achievable results. After years of funding planning and implementation projects, there is still uncertainty about the effectiveness of these projects to improve water quality. One notable exception is the investment in the consensus negotiations that resulted in the Forests and Fish Report and improved forest practices rules directly related to water quality. Riparian

protection measures, and reduced forest road-related sediment as a result of Road Maintenance and Abandonment Planning (RMAPS); as well as Cooperative Monitoring, Evaluation and Research (CMER's) research and monitoring efforts have and will continue to improve water quality.

It is imperative that the state fund projects that "will get the job done." That places much responsibility on both the local recipients of funds and fund administrators to make sure that when projects are chosen for funding, measurable outcomes are identified and achieved."

Response: Change made.

7. Page 37 – the paragraph beginning with "The greatest impact of…."
Please consider adding the following language:

"The greatest impact of state agencies on public policy is from the ability to use a consensus based problem-solving approach to address challenging natural resource issues with other vested stakeholders (Forests and Fish Report); from regulations state agencies promulgate; from technical assistance programs; from grants awarded; and from agencies' ability to carry out tasks mandated by statutes."

Response: Suggested language inserted.

8. Page 50 – Table 5.1

A more thorough explanation is needed (perhaps in Chapter 3) as to how the "Objectives to be fulfilled" in Table 5.1 were determined. There are inconsistencies between policy objectives of the forest practices program/rules and the objective listed as "Preserve natural ecosystems" in Table 5.1. For example, the existing program listed in Table 5.1 "Implement the forest practices rules that pertain to water quality protection" link to the objective "Preserve natural ecosystems". In reality, the objective of the forest practices program is to protect public resources, including water quality while assuring that Washington continues to be a productive timber growing area. It's misleading to make the link to preservation of natural ecosystems when forest practices include among other activities, timber harvest and forest road construction and maintenance. How can we reconcile this difference?

Response: Plan objectives linked to forest practices activities have been revised.

Larry Snyder
6310 N. Pittsburg
Spokane, WA

What good are BMPs, pro active product for prevention, if you have NO enforcement against violators!! The answer that it is TOO expensive to prosecute is ridiculous. Put me on a commission to find violators—you prosecute and fine them!! Give me 25% of all the money you

collect and I will be able to retire real soon. You speak about money to inform, educate, and have public forums—spend it on enforcement!! Then you can and will make a difference.

Response: We agree that enforcement and compliance support are good tools to help control nonpoint pollution. In general, Ecology's approach is to work with people first to see if pollution problems can be remedied before going to enforcement. Many people want to do the right thing, but just do not know what the right thing is. Others can be persuaded to do the right thing when they learn that their actions really do make a difference. Still others are persuaded by neighbors or community leaders who are knowledgeable about nonpoint pollution. However, there will always be some people who will not respond until they face possible enforcement.

Richard C.R. Price, P.E.
Stevens Public Utility District (Stevens P.U.D.)
P O Box 592
Loon Lake WA 99148-0592

1. It is clear from the information presented at the public meeting that Ecology sees the benefit of "connections" with local people. While this may seem like just common sense to many people, it is certainly a noble goal and realistic standard for all government agencies to follow. We notice that EPA has come to a similar conclusion.

My opinion is that the only realistic way to "connect" with the local people is for some Ecology staff to live and work with local people all over the state. State Fish and Wildlife and the state Department of Natural Resources both have many more offices around the state than Ecology. The mere fact that Ecology has so few regional offices and such a large concentration of staff in Lacey creates a culture in Ecology that can result (and I think does) in a "we vs. them" or worse yet "us vs. the natives" mentality.

By spreading many of the existing Ecology staff around the state, the needed "connections" would occur naturally.

I recommend Ecology take "connections" serious enough to consider relocating many of its state staff to local offices around the state. This may be the only way to actually accomplish this worthy goal. I believe many others would also support this reorganization of Ecology.

Response: In addition to the four regional offices, Ecology has field offices in Bellingham, Vancouver, and Kennewick. Staff is also stationed in Twisp and Walla Walla.

2. For 3 years the Stevens P.U.D. has been earnestly attempting to obtain financing from DOE for a needed county-wide septage program. However, to date we have been unsuccessful.

Our comments pertain to 2 items in the Table in Appendix A of the FY2006 Guidelines of the Water Quality Program Funding Cycle and the use of 319 funds for:
1) "onsite wastewater systems maintenance programs (see footnote 4)" and

2) "Vehicle purchase for the transportation of liquid or dewatered sludge or septage and specialized vehicles used and stored at the project site or recipient offices (e.g., carts for transporting samples, large tools, pumps)."

It is clear from this Table that Comprehensive Septage programs are eligible for Section 319 grant funds. However, during the last 2 annual application workshops we were told by top-level DOE staff that our proposed program was not eligible for 319 funds so there was no reason to apply for 319 funds. Therefore, we did not apply.

However, we do plan to apply next cycle, and we feel strongly that our application should be accepted by Ecology. It is also requested that Ecology staff work closely with us on completing the application to determine how to present the program in the most beneficial manner.

Response: We reviewed this issue with staff from Ecology's Financial Management Section. Unfortunately, the project described is not eligible to receive Section 319 funding.

Heather Trim
Urban Bays Program Coordinator
People for Puget Sound

Our specific comments on the plan follow:

1. Page 3. We recommend that you add a figure from the Puget Sound Action Team's 2004 State of the Sound report that shows the amount of impervious surface in the Puget Sound drainage area. This figure dramatically brings home the extent of the population problem as it relates to nonpoint source pollution.

Response: Figure added.

2. Page 4, first full paragraph. "The primary water pollution problems in Washington are high temperature, fecal bacteria, pH, low dissolved oxygen, metals, and nutrients." This sentence is incorrect and misleading. The sentence should be clarified to state that it is based on the 1998 303(d) list which is now out of date, that many water bodies have not been analyzed for a number of contaminants (most notably toxic chemicals) and that additional studies by United States Geological Survey, National Marine Fisheries Service and others have found pesticide and other toxic contamination problems that are related to nonpoint source pollution.

Response: A review of the 2004 Water Quality Assessment results indicate that statewide, the same key elements that were shown to affect water quality from the 1998 303(d) list continue to appear in new listings. Of the total list of polluted waters, about 80 percent are made up of these parameters. The other 20 percent include chemicals, and other pollutant criteria. Based on your comment, we did revise language in the paragraph to indicate that the pollutants mentioned are the most commonly found, rather than the primary cause of problems. We do agree that there is a significant percentage of waters in the state that have not been analyzed for water quality. However, it is important to keep in mind that the assessed segments are often indicative

of problems that are then investigated at a larger watershed level, to determine the extent of the source causing the problem.

3. Page 5. All references to Washington pollutants on this page and forward should be qualified by "as listed on the states 1998 303(d) list." People For Puget Sound strongly recommends that the plan go beyond just relying on data from the old 303(d) list. This is a limited data source and does not tell the whole story of nonpoint source pollution in the state, especially in the Puget Sound drainage.

Response: The plan does note that listed pollutants are derived from a limited data set.

4. Page 5, 2nd paragraph. Again, why should the state prioritize work on only the 303(d) listed water bodies? We will likely get more bang for our cleanup buck if we focus on some of the toxic contaminants as well. Most of the stormwater Best Management Practices (BMPs) that will be put into place by cities will address PAHs, phthalates, and pesticides and other contaminants, most of which are not currently listed on the 303(d) list.

Response: The Clean Water Act requires Ecology to prioritize its TMDL program based on the 303(d) list. However, much of the other work we do addresses other priorities. For instance, Ecology's Water Quality Program recently produced the stormwater manuals for eastern and western Washington, which municipalities will use to implement their stormwater permits. Many of the best management practices in these manuals will help to address toxic contaminants in urban stormwater.

In the 2004 legislative session, Ecology was directed to establish, through rule, specific criteria for use in identifying persistent bioaccumulative toxics (PBTs) that pose human health or environmental impacts in Washington, and a clear process for developing chemical action plans to address those impacts. The draft rule has been released for public comment, and the rule is expected to be final in fall of 2005. For more information on the draft rule and Ecology's other work on toxic pollutants, please see the Ecology PBT strategy website at http://www.ecy.wa.gov/programs/eap/pbt/pbtfaq.html

5. Page 5, Ecology's Quality Index. The text in this section should be clarified to state that the Ecology Quality Index only covers a fraction of the water bodies in the state and it primarily focuses on conventional stressors and contaminants.

Response: More information was added to the description of the Water Quality Index.

6. Page 6, final paragraph. This paragraph does not add to the plan in a meaningful way and should be deleted or significantly reworded.

Response: Paragraph deleted.

7. Page 7, general comment about the chapter. This chapter does not mention other potential and important nonpoint source categories that are included in nonpoint source plans from other

states: aerial deposition, on-site systems, and invasive species. Given that these are non point sources, they should be addressed in this nonpoint source plan.

Response: We have added a discussion about on-site systems. We did not discuss aerial deposition because this is an issue about which we can do little, and we intend the plan to focus on actions that can make a difference. Ecology has an invasive species program. Information about it may be found at http://www.ecy.wa.gov/programs/wq/links/plants.html

8. Page 7, 2nd full paragraph. "Land use is the major source of nonpoint issues and problems." This sentence does not make sense and is inaccurate.

Response: Sentence edited to make it clearer.

9. Page 16, 1st paragraph. "It is estimated that 55% of impaired waters are degraded by pollution sources that originate from agriculture activities." Does this sentence refer to the nation? Washington? We suggest that more references need to be cited in the text overall and some sentences need to be clarified. For example, in this same paragraph, additional edits could include: "Most of the degradation is attributed to loss of riparian corridors along rivers and creeks. The resulting water quality problems are increased fecal coliform contamination, high temperature, and excessive nutrients. The most common agricultural activities leading to impairment of beneficial (or designated) uses are those associated with livestock access to riparian areas. Those activities lead to high fecal coliform bacteria counts from manure, increased sedimentation, and loss of trees in riparian areas ~~that result in~~ leading to increased surface water temperatures. In addition to degradation of surface waters, agriculture activities can cause groundwater pollution when fertilizers (manure or synthetic) and pesticides (herbicides, insecticides, and fungicides) are improperly applied to fields and other cropland and infiltrate down to the groundwater."

Response: We received several comments regarding that number. It originally came from Washington's 1998 305(b) report. However, we took out the 55% number and used the national average by including a chart from the National Water Quality Inventory that showed relative contributions from the various sources.

10. Page 16, last paragraph. "Both point and nonpoint sources of water pollution from livestock are controlled through permitting processes and implementation of educational and outreach efforts." Pollution is not controlled through implementation of education and outreach efforts. We suggested adding the term "Best Management Practices" in the sentence.

Response: BMP language added.

11. Page 17, 1st paragraph. We suggest that a more up-to-date report of agricultural nonpoint sources be included in this paragraph. 1989 was 16 years ago and hopefully we have made some improvements since then.

Response: The 1989 assessment has not changed. The 1998 305(b) assessment also reported that nearly half the river miles assessed were negatively impacted from activities associated with agricultural activities. That is stated in this paragraph.

12. Page 18, bulleted items. It is not clear to the reader that these two bullets follow from the sentence that immediately before. The sentence implies that the comprehensive plans will help protect critical areas and yet the bullets only talk about problems caused by growth.

Response: Edits made..

13. Page 18, 4th paragraph. "The problem is changes in land cover, no matter how they occur." This is a good point but needs to be clarified for the general public.

Response: Section edited for clarity.

14. Page 18, last paragraph. LID needs to be explained for the general public.

Response: Done.

15. Page 19, 1st paragraph. The Puget Sound Action Team's LID manual is published and it would be great to include the url in the plan.

Response: URL inserted.

16. Page 19. It would be helpful for the reader if the Phase I and Phase II municipalities were listed in a table.

Response: Comment noted, however, this plan does not focus on Phase I and Phase II permits because these discharges are considered point sources. Instead, the focus is on things people can do to control stormwater at the source.

17. Page 20. This section about urban stormwater does not sufficiently address toxic contaminants. Specifically, PAHs, metals, phthalates, mercury, pesticides, etc. should be described. These are current and significant issues in urban stormwater. A great deal of detail is devoted in other sections to forestry problems or riparian zones, for example, but a similar amount of detail is lacking in this critical section of the document.

Response: We added PAHs, phthalates, mercury, and pesticides to our paragraph describing the types of contaminants that stormwater carries. However, this plan does not focus as much on urban stormwater as it does on forestry or agriculture because a large portion of urban storm water is regulated as a point source, and this plan is about nonpoint sources. The strategy in this plan is to focus on preventing pollution from entering municipal stormwater systems. As noted above, the two stormwater manuals developed by Ecology contain an array of best management practices municipalities will implement to address stormwater problems. Many of these practices will help to address toxic contaminants in urban stormwater.

18. Page 25, 2nd full paragraph. The date of the Puget Sound Plan should be listed and this should be footnoted. In addition, the first sentence does not follow from the previous paragraph and needs to be clarified. "The Puget Sound Plan (19xx) identified ~~other~~ important wetlands benefits for human communities, including the slowing and storage of floodwater, cleansing water of certain pollutants, recharging ground water, and serving as an outlet for ground water to recharge streams (ground water discharge) and providing recreational areas."

Response: Puget Sound Plan is now footnoted.

19. Page 31. Significantly lacking in the Objectives is a goal to stop pollution by implementing BMPs and institutional controls. This is a major gap in the strategy. We understand that Ecology plans to push for education/outreach and better understanding of the issues by the general public, but this effort should supplement, not replace, other approaches that are currently being funded by Ecology. "Focus funding on the most effective strategies" does not adequately state the BMP goal, if that is what is intended.

Response: We added a BMP section under "How Will We Achieve These Objectives?" However, it should be noted that the strategies outlined in this plan do not replace other approaches currently being funded by Ecology. Rather, the intent of the nonpoint plan is to create strategies that address problems we believe are not getting enough attention. In that way, the plan will supplement existing efforts.

20. Page 32, 1st paragraph. It seems from the discussion on previous pages that restoration of wetlands should also be a priority, in addition to other habitat types. One main goal could be to stop the loss of habitat.

Response: Wetlands were added to this section.

21. Page 47. We suggest the addition of other important "outcomes." Sediment quality, removal of water bodies from the 303(d) list, and biological monitoring results (i.e., are we actually improving the health of our wildlife species?).

Response: We agree that the outcomes proposed are also important, however, they depend on much more than the actions contained in this plan. Our challenge is to focus on outcomes that will help us evaluate the effectiveness of the state's nonpoint efforts. Obviously, when we assess the effectiveness of our entire water quality program, we will consider outcomes such as sediment quality, waters on the 303(d) list that achieve water quality standards, and biological indicators.

22. Chapter 6. A significant amount of monitoring funding should be directed towards sampling for toxic contamination and emerging chemicals. We already know that we have nutrient and temperature problems throughout the state and through existing programs these issues are being addressed. If we don't put resources into determining the scope of the toxic problem, both geographic and amount, then we will be behind the curve in coming to solutions.

Response: Ecology's Environmental Assessment (EA) Program currently conducts a wide range of toxics monitoring activities statewide. These include:

- *Bimonthly monitoring of selected streams and rivers for metals in water.*
- *Annual monitoring of toxics in edible fish tissue from 20 lakes and rivers statewide.*
- *Annual monitoring of toxics in marine sediments (Puget Sound).*
- *Spatial and trend monitoring programs for persistent, bioaccumulative toxics (PBTs) in edible fish tissue and freshwater sediment cores.*
- *Weekly monitoring for pesticides in water in selected watersheds of the state.*

The EA Program also conducts environmental monitoring studies statewide for pollution source identification and control. These include water cleanup studies (aka TMDLs) for toxics, surface and groundwater monitoring of toxics cleanup sites, and miscellaneous studies requested by client programs within Ecology (for example, in 2004 EA sampled for pharmaceuticals and personal care products in surface and ground waters near Sequim).

However, the universe of toxics monitoring needs far outstrips available resources within the EA Program. If additional funding sources can be identified and directed to EA, this information gap could be narrowed.

23. In sum, People for Puget Sound would like to see the Department of Ecology put more focus on toxic contamination in this plan to address nonpoint sources in the state.

Response: Comment noted. See description of Ecology's PBT work and toxics monitoring in previous responses.

Wendy Steffensen
North Sound Baykeeper
RE Sources
1155 N. State St., suite 623
Bellingham, WA 98225

March 18, 2005

Unfortunately, I was unable to give the non-point pollution plan adequate review due to time limitations. I do, however, have some concerns with the plan given my cursory view.

1. I find that the explanation of pollution frequency and type is limited. The document should explain that not every body of water is tested, and that many chemical constituents are also not tested.

Response: A discussion was inserted.

2. No discussion was given to the pre-spawn mortality of Coho salmon at Longfellow Creek and I find that to be a grievous omission, as the likely reason for their premature death was stormwater contamination.

Response: The nonpoint plan provides a high level look at nonpoint issues, and does not use site specific examples.

3. In Chapter 5, outcome performance measures were listed. These did not include any measured reductions in metals, oils, and organic chemicals. These are some of the major contaminants in urban areas and these need to be addressed and prioritized. Additionally, a measure of the biological health of urban waterways as affected by stormwater should also be included. I believe that we may not always be able to measure individual chemicals, but may be able to discern harm from the composite stormwater, where it exists, by looking at biological impacts.

Response: We agree that these pollutants are important. However, Ecology is addressing urban stormwater through the Phase 1 and Phase 2 municipal stormwater permits, which include a monitoring component to assess whether pollutant reductions are occurring. The intent of the nonpoint plan outcome measures is to try to sort out the results of the state's nonpoint work, which does not include municipal stormwater systems that are or will be covered by permits.

Janet McRae
Skagit County Property owner
Cattlerancher
taxpayer

1. In your plan you claim that we have polluted waters in the Skagit river, however you do not say what it takes to meet the clean water requirements. I am a part of a group that has done extensive testing in the Skagit and Samish watersheds and we find the water quality to be very good, the temps, turbidity and the fecals are all within the standards that I believe to be state standards.

Response: Comment noted. The state nonpoint plan makes no claims about water pollution in the Skagit River. However, the 1996 and 1998 303(d) lists, which are the state's lists of polluted waters, and the draft 2004 water quality assessment list portions of the Skagit River and its tributaries for fecal coliform, temperature, dissolved oxygen, ammonia-N, and total PCBs. These lists are created by comparing monitoring data to the pollution limits established in the state water quality standards. The lists of polluted waters can be found at
http://www.ecy.wa.gov/programs/wq/303d/index.html
The state water quality standards can be found at
http://www.ecy.wa.gov/programs/wq/swqs/index.html

Many of the fecal coliform listings will be addressed through implementation of the Lower Skagit River Fecal Coliform Water Cleanup Plan (Total Maximum Daily Load/TMDL), which was

completed in June 2000. Ecology is also presently working on a temperature TMDL for the Lower Skagit River.

2. In the past, we have attended DOE meeting where it was stated that the water in the Skagit River met the drinking water quality standard to a site just above Sedro-Woolley, now you tell us that none of these upriver streams are meeting the standard, with the addition of many miles of streamside buffers. Are we to come to the conclusion that the buffers have made a negative impact on the water quality in the Skagit river system.

Response: As noted above, the nonpoint plan contains no statements about water quality in the Skagit River, although we know from the past three 303(d) lists that the Skagit has some pollution problems. Without more information about the riparian buffers that have been installed along the river—how many linear feet and where they are, for example—it is not possible to assess their effectiveness. It is much more likely that human impacts to the river system have increased even as some people were installing buffers, so one problem was being solved while another was being created.

3. You state that we need to protect and restore water quality by creating a culture in Washington State that values ecosystem health and biodiversity. I do not believe that DOE has the right to dictate what we are to value, that should be a personal choice and the government has no right telling us what to think. THIS MUST BE DELETED.

Response: The nonpoint plan does not tell anyone what to think. However, it does recognize that ecosystem health and biodiversity are keys to a healthy state. The comprehensive review of the state's needs for biodiversity data and conservation resulted in the formation of the Washington Biodiversity Council with members appointed by the Governor. The council is charged with formulating a 30-year prioritized strategy to protect and recover the state's biodiversity. More information on the state's biodiversity program can be found at: http://www.iac.wa.gov/biodiversity/

4. The document states that a large portion of the habitat needs to be restored. What is meant by a large portion? If this large portion is "restored", will the quality be further degraded as it has with the already installed buffers?

Response: The nonpoint plan does not explicitly state an amount of land that should be restored to a fully functioning condition. However, King County recently adopted an ordinance that stipulated that 65 percent of rural watersheds must be left in a forested condition.

5. I find this document to be poorly written, with to many personal opinions, and the DOE should be presenting an unbiased document with just the facts. I find no scientific facts as reported in journals or papers. I think this document is very inadequate.

Response: Comment noted.

Shawn Ultican
Kitsap County Health District
Water Quality Program

PUBLIC HEALTH - Always Working for a Safer and Healthier Washington.

Our comments on Volume 3:

1. The plan is internally inconsistent in identifying and measuring significant common water quality problems. The current plan states it will focus primary attention on reduction in sediment, nitrogen and phosphorous as outcome performance measures. While an important part of nonpoint pollution, nutrients are one of the lowest parameters listed in Figure 1.4 Relative Significance of Nonpoint Parameters. Sedimentation is not listed at all.

Response: We agree that these are not the parameters Ecology would have chosen to use to measure the effectiveness of our nonpoint programs. However, we are required by EPA to report on these as a condition for continuing to receive federal funding. As you may know, Ecology has been focusing most of its work to improve water quality in waters with these significant problems – temperature, fecal coliform bacteria, and dissolved oxygen through our TMDL or Water Cleanup planning process. .

2. The significance of pollutants with long term affects on human and animal populations is not addressed. For example, the plan indicates that compounds such as heavy metals, pesticides, and other chemical pollutants are a relatively insignificant part of nonpoint pollution. It does not even mention pharmaceutical compounds. However, research shows that these types of pollutants can cause some of the greatest long term harm on human and environmental health.

Response: Pharmaceuticals in water is an emerging issue. However, Ecology has done some work on the pharmaceuticals issue. In 2004, the Environmental Assessment Program sampled for pharmaceuticals and personal care products in surface and ground waters near Sequim. Ecology is presently working on toxic chemicals through its TMDL program and through development of a persistent bioaccumulative toxins (PBT) rule. Ecology and EPA have produced or are working on TMDLs to address toxic chemicals in the Snohomish, Similkameen, Walla Walla, and mid Columbia Rivers and in Bellingham Bay. In addition, Ecology's Environmental Assessment Program performs special verification studies for waters listed for toxic chemicals on the 303(d) list prior to beginning work on a toxic TMDL.

3. The role and responsibilities of local governments in monitoring and correcting nonpoint pollution is greatly overlooked in the current draft. In the section on "Local Government Implementation Activities" (p.36), the role of local efforts is emphasized as "on-the-ground implementers of many nonpoint pollution control activities". However in Table 4.2 Matrix of Agency Nonpoint Responsibilities, the local agencies don't have anything listed under the Recreation category and Special Districts are only listed for "technical assistance". This section should mention at least a sampling of the local activities that "on-the-ground implementers" take to measure and correct nonpoint pollution.

Response: We inserted your suggested language. Volume 1 of the Nonpoint plan, found at http://www.ecy.wa.gov/biblio/0410063.html, captures local governments' plans of action to control nonpoint source pollution. Volume 3 is the state agency plan of action.

Douglas L. Peters
Senior Planner
Growth Management Services
WA State Community Trade and Economic Development

Thank you for the opportunity to provide comments on the draft document cited above. Overall the document has lots of good information and should serve to help educate more state citizens as to the important role they play in controlling nonpoint water quality pollution.

There are three specific improvements we suggest:
1. On page 18, the discussion of Urban/Rural development could use some good examples to balance the current two descriptive bullets that describe the negative examples of such development. We have included a document on urban density with this letter for possible inclusion of positive examples of planning for growth under the Growth Management Act (GMA).

Response: Section changed to accommodate the suggestion.

2. On page 8, the end of the first paragraph could be elaborated on by including a statement about the GMA requirements to designate and protect critical areas. We suggest the following language: Change the last sentence to add the word "clear" between 'no' and 'legislation'. Add another sentence at the end like: "The Growth Management Act requires existing older critical areas ordinances to be amended to include the best available science, and that includes specifically addressing all critical areas within the landscape, including those located on agricultural lands. The requirement to include the best available science at RCW 36.70A.172 (1) applies to all jurisdictions in the state and must be part of required updates to comprehensive plans and development regulations conducted over the next few years."

Response: Comment incorporated.

3. On page 27, after the last paragraph, also add language such as: "The GMA requires at RCW 36.70A.172 (1) to include the best available science in plan policies and development regulations that designate and protect critical areas and also that jurisdictions give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries."

Response: Comment incorporated.

4. The following minor suggestions might improve readability or comprehension by the reader:
   • On page 3, last paragraph, add to next to last sentence, after 'land uses', the words in parentheses
   "(agriculture and forestry)".

• On page 15, add to the text above Fig. 2.4 the definition or 'breakpoint' between small and large CAFOs.
• On page 19, top paragraph, underline the title of the PSAT manual.
• On page 19, last paragraph, possibly mention the delay in issuing Phase 2 permits, which is almost 4.5 years in the works so far, and also describe the intent of Ecology to issue a general permit to cover many communities.
• On page 22, the use of percentages is confusing based on the number of different categories of items being discussed (people, boats, recreation boats) so it might be useful to simplify this information or cite the sources Internet site for additional details. Also consider adding the following language: "Boats come in many sizes, many have no onboard sanitation devices, and littering from boats is common."
• On page 38 change Table 4.1 to correct the CTED agency name as a Department (not an office), and the agency designee from Chris Parsons to Doug Peters.
• On page 39, it states "(T)he nonpoint plan" introduces the nonpoint workgroup, but this document is entitled Volume 3 of the Nonpoint Plan, so it is slightly confusing. You might put which volume introduces the workgroup. Also on this page the reference to Chapter 5 could also include one to Table 5.1.
• On page 42, Table 4.2 could include additional language under the line for CTED, such as, for the Agriculture, Forest Practices columns add 'designating and protecting critical areas and natural resource lands', for the Urban/Rural column add 'designating Urban Growth Areas', for the Recreation column, add 'Parks and Recreation Guidebook' (co-authored with IAC), and under the Other Activities column add 'Guidance on Urban Design and Urban Density'.
• In Table 5.1, n page 55, add CTED to the 'sustain biodiversity objective under the heading Through Habitat Alteration Activities "Develop wetland guidance documents".
• On page 65, in the section on Implementation Strategy for Local Governments, are the local water quality plans the same as watershed plan? Is please state the connection. If not describe what they are.

Response: All suggested changes made.

Appendix 1