CHAPTER

3 MANAGEMENT FRAMEWORK

Chapter 3, Management Framework, provides a brief overview of policies and programs relevant to the CCMP for the Tillamook Bay Watershed. First, habitat and water quality management are discussed on a basin-wide basis. Next, resource management programs are broken down by area: lowland and floodplain, upland forest, and estuary and slough. Lastly, opportunities for improvement and the CCMP responses are explored.

Basin-Wide Habitat and Water Quality Management

Fish and wildlife habitat, water quality, excess erosion and sedimentation, and flooding problems are profoundly interrelated. Likewise, the Endangered Species Act and the Clean Water Act – which drive this CCMP, along with various other state, federal, and local laws and programs – overlap and support one another in many ways.

In recent years, government agencies and private citizens throughout Oregon have focused on managing aquatic and terrestrial resources to better meet salmonid habitat requirements. This section provides an overview of those policies that impact the entire basin. These include the ESA, the State's voluntary Oregon Plan for Salmon and Watersheds (OPSW, or the Oregon Plan), the federal government's regulatory role in water quality management, and the Oregon Land Use Planning Program.

In many instances, elements of these plans and the CCMP address the same issues. In this case, the CCMP endeavors to at least be consistent with other plans. Other times, the CCMP recommends actions beyond the requirements of other programs. Because of the requirements of the Clean Water Act, the CCMP focuses on actions that protect and enhance the health of the estuary and Watershed. Important actions that address the economic and social well-being of the citizens of Tillamook County are often addressed in these other plans (*e.g.*, economic and public safety issues associated with flooding are discussed in the Tillamook County Flood Hazard Mitigation Plan) but are not addressed in the CCMP.

The Endangered Species Act

In 1966, Congress passed the Endangered Species Preservation Act (ESA) as a means to slow the loss of animal species to extinction. Subsequent amendments to the Act, passed in 1969 and 1973, added a new category of listing ("threatened"), expanded the Act's scope to include flora, and prohibited the trade of protected species. Congress passed further amendments to the Act in 1978, 1982, and 1988.

The ESA is perhaps the most forceful piece of environmental legislation passed to date in the U.S. More than any other environmental policy, it can restrict use of private or public land by designating it as critical habitat for endangered or threatened species. In the Tillamook Bay Watershed, listing of salmonids as threatened may result in reduced timber harvests from public and private lands, reduced recreational and commercial salmonid harvest, and a host of land use provisions aimed at protecting and enhancing habitat.

Section 3 of the ESA classifies an "endangered species" for protection when it is in danger of extinction within the foreseeable future throughout all or a significant portion of its range. A "threatened" classification is provided to a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Under the ESA, the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) share responsibility for listing and overseeing the restoration of populations of threatened and endangered species. The NMFS oversees all ESA responsibilities for anadromous salmonids and other marine listings. The agencies' responsibilities include: deciding on and reviewing species' status; designating "critical habitats:" Section 7 consultations with other agencies on their activities and plans for compliance with the ESA; enforcing laws; and developing and reviewing species recovery plans. Oregon Department of Fish and Wildlife (ODFW) administers a statewide ESA that limits the activities of state agencies on state lands. Where overlap exists, the more restrictive federal ESA is enforced.

Incidental Take Permits

An important provision of the ESA is the "incidental takings" clause. Section 9 of the ESA prohibits the take of federally listed species without appropriate authorization. The ESA provides this authorization by issuing "incidental take" permits. An incidental taking is the "killing, harming, or harassment" of a federally listed species due to activities which are not aimed at disrupting the species and are otherwise lawful. Incidental take permits include:

- the amount (number of species) or extent (habitat loss) of anticipated take, if any;
- measures considered reasonable and prudent to minimize the take; and
- nondiscretionary terms and conditions to implement the reasonable and prudent measures, including the procedures used to handle or dispose of any individuals of the species actually taken.

Habitat Conservation Plan

Application for an incidental take permit is subject to a number of requirements. One method is for the permit applicant to prepare a Habitat Conservation Plan (HCP). Development of an HCP and application for an incidental take permit are voluntary; although, in the absence of appropriate authorization, no take can lawfully occur.

An HCP must specify the following:

- measures the applicant will undertake to monitor, minimize, and mitigate such impacts; the funding that will be made available to undertake such measures; and the procedures to deal with unforeseen circumstances;
- alternative actions the applicant considered that would not result in take, and the reasons why such alternatives are not being utilized;
- impacts likely to result from the proposed taking of federally listed species; and
- additional measures that NMFS may require as necessary or appropriate for the purposes of the conservation plan, such as an Implementing Agreement that spells out the roles and responsibilities of all parties.

The Northwest Forest Plan

Originally adopted in 1994 as the federal response to the Endangered Species Act listing of the Northern Spotted Owl, the Northwest Forest Plan amended the Bureau of Land Management and U.S. Forest Service Land Use Planning and Management Documents. Certain best management practices (BMPs), often stricter than those required on state or private land, were adopted for federal forest lands. Regardless of the status of these owl populations, the Northwest Forest Plan will likely remain in place as a measure related to the listing of various other species throughout the Northwest.

The Oregon Plan for Salmon and Watersheds

In an effort to prevent the need for the federal restrictions imposed under the ESA, Oregon developed the Oregon Plan as a tool to rebuild depleted salmonid stocks. Driven largely by volunteer efforts, the Oregon Plan promotes four concepts fundamental to watershed planning and aquatic habitat restoration:

1) coordination among all involved parties (agencies, industries, volunteers, etc.);
2) locally-based actions and solutions;
3) extensive monitoring; and
4) adaptive management.

The National Marine Fisheries Service (NMFS) initially accepted the plan as a viable way to halt further dwindling of coho (and later, steelhead) populations, agreeing to delay a federal listing for two years. NMFS would then review the progress made during the first two years of the Oregon Plan's implementation. Conservation groups criticized the Oregon Plan, however, claiming the plan relies too heavily on voluntary commitments and lacks the strength to reverse declining numbers of fish. In June 1998, a federal magistrate ordered NMFS to immediately reconsider listing coastal coho, calling the agency's decision to accept the Oregon Plan "arbitrary and capricious."

The NMFS listed the coastal coho as "threatened" in August of 1998. Despite the listing, the State continues to implement the Oregon Plan to reach its goal of restoring native fish populations and the aquatic systems that support them.

The Oregon Plan's broad-based, multi-faceted approach evolved from two measures: the Healthy Streams Partnership (HSP) and the Coho (followed by the Steelhead) Restoration Plans. These initiatives promote activities that involve all of Oregon's public and private land use stakeholders. Since the Oregon Plan was developed in the same time frame as the CCMP, they overlap considerably. Related Oregon Plan actions are listed here, and cross-referenced in the CCMP Action Plans.

The Healthy Streams Partnership

Underscoring the Oregon Plan's emphasis on multi-party coordination, the HSP represents a commitment among several public and private interests to restore water quality in Oregon's streams. Most notably, the HSP outlines an agreement between the Oregon Department of Environmental Quality (DEQ) and the Oregon Department of Agriculture (ODA) to design specific plans aimed at improving water quality in watersheds throughout the State. For each agency, the partnership prioritizes watersheds to reflect the State's salmonid restoration effort and sets a

specific timeline for the planning process. Specific planning and regulatory activities, most notably TMDLs and SB 1010, are discussed within this chapter.

Restoration Plans

As the backbone of the Oregon Plan, the goal of both the coastal Coho Plan (formerly known as the Coastal Salmon Restoration Initiative) and the Steelhead Supplement is to restore coastal salmonid runs in Oregon to support sustainable recreational and commercial fisheries. These comprehensive, science-based plans outline a range of public and private, locally-based activities to restore salmonid populations and their habitat. They impose virtually no new restrictions on the public, relying instead on the voluntary efforts of landowners and stakeholders. Similarly, the plans provide extensive measures for individuals, citizens' groups, industry, landowners, and government agencies to restore their watersheds through focused and coordinated efforts.

Within the Tillamook Bay Watershed, the following groups or agencies implement the Restoration Plans. This list summarizes the workplans identified in the Steelhead Supplement that are related to the CCMP, and is therefore not exhaustive. Corresponding workplans exist for coho. For an exhaustive list, please refer to the Oregon Plan. For a more detailed summary of the measures contained in the Oregon Plan that impact the Tillamook Bay Basin, please refer to Appendix D.

Department of Fish and Wildlife (ODFW). The ODFW has one of the largest roles in implementing the Oregon Plan. The Department's role can be broken down into four broad responsibilities: (1) physical habitat assessments and improvements; (2) technical assistance to agencies and citizens; (3) hatcheries; and (4) fisheries. Each of these responsibilities consists of many measures. Specific CCMP actions include:

ODFWIA1S	Establish Population Health Goals for Wild Steelhead (and Coho)
ODFWIB1S	Assess Adult Escapement and Juvenile Production of Wild Steelhead
ODFWIB2S	Inventory and Monitor Wild Steelhead Habitat and Distribution
ODFWIB3	Habitat Restoration Evaluation
ODFWIB4	Inventory Artificial Barriers
ODFWIB5	Inventory Water Diversions (also involves WRD and OSP)
ODFWIIIA2	Manage Steelhead Fisheries to Minimize Impact on Wild Steelhead
ODFWIIIA3	Manage Trout Fisheries to Reduce Ecological Interactions and Mortality on Juvenile Salmonids
ODFWIIIC2S	Evaluate Hook and Release Mortality on Wild Steelhead

ODFWIIIC3S	Assess Marine Survival of Wild Steelhead
ODFWIIID1S	Emphasize Wild Steelhead Restoration in Annual Cooperative Enforcement
ODFWIVA1	Provide Technical Assistance to Regulatory Agencies for Habitat Protection
ODFWIVA3	Apply for Additional Instream Water Rights
ODFWIVA5	Prevent Large Wood Removal
ODFWIVA6	Promote and Assist Voluntary Habitat Protection Actions
ODFWIVA7	Landowner Stewardship Award
ODFWIVA8	Identify Instream Flow Priorities
ODFWIVB2	Promote Habitat Restoration
ODFWIVB3	Promote Use of Beavers to Restore Salmonid Habitat
ODFWIVB4	Use Hatchery Carcasses to Increase Wild Salmonid Production
ODFWIVB6	Fish Habitat Improvement Tax Credit Program
ODFWIVC1	Cooperative Removal of Barriers
ODFWIVC2	Screen Diversions Less Than 30 cfs
ODFWIVC4	Screening of Water Diversions Greater Than 30 cfs
ODFWIVC5	Enhancing Compliance with Fish Screening Statutes
ODFWIVC6	Enhancing Compliance with Fish Passage Statutes
ODFWVA1	Conduct an Outreach Program

Department of Forestry (ODF). Like ODFW, ODF has a range of responsibilities in implementing the Oregon Plan. The major ODF measures include assessing habitats, reducing sediment loading from road failures, improving riparian widths and compositions, improving fish access to spawning and rearing areas, and improving instream habitat conditions:

ODF1S	Road Erosion and Risk Project
ODF2S	State Forest Lands Road Erosion and Risk Project
ODF3S	Technical and Policy Review of Rules and Administrative Processes Related to Slope Stability
ODF4S	Stream Habitat Assessments
ODF5S	North Coast Salmonid Habitat Restoration Project
ODF7S	Fund 7 New Fish Biologists to Provide Technical Assistance for Salmonid Habitat Restoration
ODF8S	Riparian Hardwood Conversions
ODF9S	Northwest State Forest Lands Management Plan
ODF10S	Forest Practices Monitoring Program
ODF11S	Monitoring of Riparian Management Areas under the Forest Practices Act

ODF12S	Monitoring Effectiveness of BMPs in Protecting Water Quality During Aerial Applications of Forest Pesticides
ODF13S	Storms of 1996 Monitoring Project
ODF14S	Monitoring Water Temperature Protection BMPs
ODF15S	Evaluation of Road and Timber Harvest BMPs to Minimize Sediment Impacts
ODF16S	Evaluation of Adequacy of Fish Passage Criteria
ODF17S	Site Specific Plans for Vegetation Retention within RMAs on Northwest and Southwest (Grants Pass) Oregon State Forest Lands.
ODF18S	Wildlife Tree Placement on State Forest Lands
ODF19S	Additional Conifer Retention along Fish Bearing Streams in Core Areas
ODF20S	Limited RMA for Small Type N Streams in Core Areas
ODF21S	Active Placement of LWD during Forest Operations
ODF22S	25 Percent In-Unit Leave Tree Placement and Additional Voluntary Retention
ODF23S	BMP Compliance Audit Program
ODF24S	State Forest Lands Stream Habitat Assessment and Instream Projects
ODF25S	Fish Presence/Absence Surveys and Fish Population Surveys
ODF27S	Increased Riparian Protection
ODF28S	Protection of Significant Wetlands, Including Estuaries
ODF29S	Forest Practice Chemical Protection Rules
ODF30S	Large Woody Debris Recruitment Incentives
ODF31S	Large Woody Debris Placement Guidelines
ODF32S	Fish Presence Survey [OAR 629 635 200(11)]
ODF33S	Increase Number of Streams and Stream Miles Protected
ODF34S	Improve Fish Passage BMPs on Stream Crossing Structures
ODF35S	Increase Design for Larger Flows
ODF36S	Upgraded Road Construction and Fill Requirements
ODF37S	Upgraded Skid Trail Construction and Fill Requirement
ODF38S	Clearcut Limitations
ODF50S	Kilchis Watershed Analysis
ODF54S	Forest Resource Trust
ODF55S	Stewardship Incentive Program (SIP)
ODF 56S	Landowner Stewardship Award
ODF57S	Enhancement of ODF Monitoring Program
ODF58S	Liability Limits for Fish Enhancement Projects
ODF59S	Integrated Forest Assessment
ODF60S	Additional Forest Products Harvest Tax (HB 3700)

ODF61S	Analysis of "Rack" Concept for Debris Flows
ODF62S	Voluntary No Harvest Riparian Management Areas

Private Forest Landowners. Under the Oregon Plan, the private forest industry engages in a number of projects to improve water quality and enhance habitat, including a $170 million program to improve fish passage and road management. Examples include culvert repair, stream enhancement work to core area streams, bridge replacements, and increased buffers on fish bearing streams. Road audit/inventory is in its second year of determining priorities for scheduled maintenance and upgrade to a 100-year flood storm occurrence, and prioritizing placing crushed rock on forest roads to reduce or eliminate sedimentation. OFIC commitments are outlined in ODF's workplans.

Department of Environmental Quality (DEQ). DEQ's major roles in the basin under the Oregon Plan include enforcing the provisions of the Clean Water Act, revising and implementing water quality standards, managing NPDES permits, conducting water quality monitoring, and drafting Total Maximum Daily Loads:

DEQ1S	Implementation of Recently Revised Water Quality Standards for Temperature, Dissolved Oxygen, and Sedimentation
DEQ2S	Development of 303(D) List and Identification of Priorities for TMDL Development
DEQ3S	Watershed Council Support
DEQ4S	Enhance 401 Certification for Fill/Removal Operations
DEQ5S	Revise Water Quality Standard for Sediment
DEQ6S	Implement Antidegradation Water Quality Standard
DEQ7S	Apply for Instream Water Rights on Streams with TMDLs
DEQ9S	Implement Water Quality Standards for Biological Criteria, Nutrients, Toxics and pH
DEQ10S	Develop Water Quality Standards for Wetlands
DEQ11S	Revise Water Quality Standards for Nutrients
DEQ12S	Designation of Salmon Critical Habitat as Outstanding Resource Waters
DEQ14S	Management of Point Source Discharges through NPDES Permits
DEQ15S	Management of Storm Water Discharges through NPDES Permits
DEQ16S	Revise SRF Loan Criteria to Help Protect Salmon
DEQ17S	Implement On-site Program to Control Nutrient Loads
DEQ18S	Implement Groundwater Protection Act
DEQ19S	Water Quality Monitoring and Assessment
DEQ20S	Coastal Nonpoint Pollution Control Program

DEQ21S Tillamook Bay National Estuary Program

Division of State Lands (DSL). DSL is revising its removal-fill permitting requirements, reducing instream gravel removal activities, revising essential salmonid habitat rules, and coordinating restoration, education, and planning activities with other agencies:

DSL1 Develop Standardized Permit Conditions Reflecting Best Management Practices for Removal Fill Activities

DSL2 Limit Commercial Gravel Removal from Individual Bars to Annual Recruitment

DSL3 Revise Administrative Rules on Essential Salmonid Habitat

DSL4 Strengthen Interagency Coordination in Removal-Fill Permitting

DSL6 Revise the GA for Erosion Control to Enhance Habitat Protection

DSL7 Revise the GA for Fish Habitat Enhancement to Improve Habitat Values

DSL8 Facilitate More Wetland Restoration and Enhancement Projects

DSL9 Develop Guidelines for Issuing Individual Permits, rather than GAs

DSL10 Conduct Monitoring and Outreach on Recreational and Small Scale Placer Mining in Essential Habitat

DSL12 Analyze a Payment in Lieu of Mitigation Approach for Commercial Gravel Removal

DSL13 Target Compensatory Wetlands Mitigation to Salmon Habitat Projects

DSL14 Work with Other Agencies to Clarify Jurisdiction over Removal of Large Woody Debris

DSL15 Increase Field Presence in Coastal Essential Salmonid Habitat

DSL16 Develop Administrative Rules for Mitigation Banking and For Payment or Protection in Lieu of Mitigation

DSL17 Promote Coordination of Wetland Inventories with Other Natural Resource Planning Efforts

DSL18 Develop Administrative Rules on Locally Significant and Outstanding State Wetlands

DSL19 Continue Implementation of Oregon's Wetland Conservation Strategy

DSL21 Evaluate the Habitat Potential of Scattered Coastal Tracts

DSL23 Update Public Education Materials on Removal-Fill Projects

DSL24 Develop Information Packets for Watershed Councils

DSL26 Analyze and Implement Regulatory Streamlining Options

DSL27 Add Permanent Field Staff in Coastal Basins

DSL31	Extend Essential Salmonid Habitat Designations to Include Steelhead
DSL33	Develop and Implement a Compliance Monitoring Program

Department of Land Conservation and Development (DLCD). Under the Oregon Plan, DLCD implements the Coastal Nonpoint Pollution Control Program (CNPCP), identifying estuarine restoration opportunities, and implementing (statewide planning) Goal 5 rules for riparian and wetland protection:

DLCD 1	Implement the Coastal Nonpoint Pollution Control Program (CNPCP)
DLCD 2	Riparian Area Technical Assistance
DLCD 3	Identify Estuarine Restoration Opportunities
DLCD 5	Implement Urban Management Measures under the CNPCP

Department of Agriculture (ODA). ODA's primary responsibilities under the Oregon Plan are to implement the SB 1010 Program, manage Confined Animal Feeding Operations, and educate farm operators:

ODA 1	SB 1010 Program
ODA 2	Confined Animal Feeding Operations Program (CAFOs).
ODA 3	Education/Outreach/Incentives

Department of Transportation (ODOT). ODOT focuses on physical improvements to roads and culverts, resource planning, education, and habitat enhancement projects:

ODOT2	Culvert Inventory, Assessment, and Remediation
ODOT3	Resource Management Plans
ODOT4	Participation in Watershed Councils
ODOT6	Environmentally Sensitive Design
ODOT7	Storage and Disposal Plan for Woody Debris
ODOT8	Statewide Erosion Control Handbook
ODOT12	Education
ODOT15	Habitat for Fish in Wetland Mitigation
ODOT19	Mitigation Banking
ODOT20	Compliance Audit

Oregon Marine Board (OMB). The Marine Board's primary effort involves increased enforcement of marine and aquatic habitat-related laws:

OMB1	Increase Number of Streams Adopted Through Adopt a River Program.
OMB2	Increase Number of Boat Waste Pump Outs and Dump Stations.
OMB3	Increase Enforcement of Outfitter/Guide Laws.

Water Resources Department (WRD). The Oregon Plan measures for WRD emphasize flow monitoring, reporting, and protection; fish passage; and instream water rights management:

WRD S 1	Public Interest Review to Protect Salmonids
WRD S 2	Water Right Transfer Review for Fish Concerns
WRD S 4	Issuance of Instream Water Rights (ISWRs)
WRD S 6	Identify Unmet Instream Flow Needs
WRD S 7	Coordinated Enforcement Plan
WRD S 8	Increased Distribution and Enforcement
WRD S 9	Installation of Monitoring Stations
WRD S 10	Inventory Water Diversions
WRD S 11	Dissemination of Streamflow Data
WRD S 12	Improving Efficiency and Prohibiting Waste
WRD S 13	Agricultural Water Conservation Program
WRD S 14	Municipal Water Management Program
WRD S 15	Instream Transfers and Leases
WRD S 16	Water Right Forfeiture
WRD S 17	Public Outreach and Information
WRD S 19	Off stream Storage
WRD S 20	Serious Water Management Problems Areas
WRD S 21	Peak Flow Protection
WRD S 22	Modification or Replacement of Diversion Dams Which Interfere with Fish Passage
WRD S 25	Compliance Rate Monitoring
WRD S 29	Amend Current Licenses to Improve Fish Passage

Federal Agencies and the OPSW:

Although not bound by State rules, federal agencies are part of the OPSW, which recognizes their efforts in the following OPSW actions:

Bureau of Land Management and U.S. Forest Service

BLM/USFS1 – Watershed/Habitat Restoration

BLM/USFS2 – Research

BLM/USFS3 – Monitoring and Evaluation

BLM/USFS4 – Inventories

BLM/USFS5 – Planning and Assessment

BLM/USFS6 – Technical Training

BLM/USFS7 – Cooperative Funding

BLM/USFS8 – Education/Interpretation/Outreach

BLM/USFS9 – Natural Disaster Coordination

BLM/USFS10 – Interagency and Tribal Coordination

BLM/USFS11 – Watershed Council Support and Coordination

BLM/USFS12 – Key Aquatic Habitat Acquisition

BLM/USFS14 – Clean Water Act Section 303 Compliance

BLM/USFS15 – Safe Drinking Water Act Implementation

U.S. Fish and Wildlife Service

USFWS1 – Jobs-in-the-Woods Program

USFWS2 – Habitat Conservation Plan Development

USFWS3 – Aquatic Habitat Conservation Agreement Development and Conservation Activities

USFWS4 – Technical Assistance on 1996 and 1997 Floods

USFWS5 – Partners for Wildlife (PFW) Program

USFWS7 – Assistance to Watershed Councils

USFWS8 – Northwest Forest Plan Implementation Assistance

USFWS9 – Biological Opinions to Prevent or Reduce Impacts to Listed Species

USFWS12 – Acquisition and Restoration of Coastal Wetlands for National Wildlife Refuges

USFWS13 – Review of Dredge and Fill Projects

USFWS14 – Response to Oil and Hazardous Substance Spills

USFWS16 – Technical Assistance for Planning

USFWS17 – Adopt-A-River and SalmonWatch Programs

USFWS18 – Support to Ongoing Educational Programs (Outdoor School and Salmon Camp)

USFWS19 – Natural Resource Education and Community Awareness of Aquatic Resources

USFWS20 – National Estuary Program

USFWS22 – Avian Predator Management

USFWS23 – Environmental Contaminant Investigations

National Oceanic and Atmospheric Administration and National Marine Fisheries Service

NOAA-NMFS1 – Hire the Fisher Habitat Restoration Program

NOAA-NMFS2 – Watershed Councils

NOAA-NMFS3 – Habitat Conservation Plans

NOAA-NMFS4 – Habitat Matrix

NOAA-NMFS5 – Northwest Forest Plan and Regional Ecosystem Office

NOAA-NMFS8 – Fisheries Harvest

NOAA-NMFS9 – Supplementation

NOAA-NMFS10 – Hatchery Research

NOAA-NMFS11 – Section 404/10 Actions

NOAA-NMFS12 – Highway Projects

NOAA-NMFS15 – Water Supply Projects

NOAA-NMFS18 – Coastal Change Analysis

NOAA-NOS19 – Coastal Management and Nonpoint Sources

NOAA-OAR22 – Oregon Sea Grant

NOAA-NMFS24 – Steelhead Genetics

NOAA-NMFS25 – Population Status

NOAA-NMFS26 – Estuarine and Ocean Ecology Research

NOAA-COP27 – U.S. Global Ocean Ecosystem Dynamics Program (GLOBEC)

NOAA-NMFS29 – For the Sake of the Salmon

NOAA-NMFS31 – Access Remote Sensing Data through the Global Fiducial Program

NOAA-NOPP32 – National Ocean Partnership Program

NOAA-OAR33 – Effects of El Nino

NOAA-NMFS34 – Data Collection

NOAA-NMFS35 – Hazardous Materials Response and Assessment

NOAA-NMFS36 – National Status and Trends Program

NOAA-NMFS37 – Estuary Eutrophication

NOAA-COP39 – Land Cover Change Analysis

NOAA-NMFS40 – Memorandum of Understanding with the Natural Resource Conservation Service

NOAA-NMFS41 – Integration of Endangered Species Act with Water Quality Management Planning

Environmental Protection Agency

EPA1 – Aligning Water Quality Recovery Priorities with Salmon Recovery

EPA2 – Development of Water Quality Standards that More Closely Match Salmon Life History Needs

EPA3 – Monitoring and Evaluation of Best Management Practices

EPA4 – Technical Assistance

EPA5 – Funding Assistance

Bureau of Reclamation

BOR1b – Funding for Oregon Water Resources Department

BOR1d – Technical Assistance for Watershed Council Activities

BOR4a – Development of Fish Kill Remediation Strategies

Natural Resource Conservation Service

NRCS1 – Conservation Operations

NRCS2 – Soil Survey

NRCS3 – Snow Survey

NRCS4 – National Resources Inventory (NRI)

NRCS5 – Plant Materials Program

NRCS6 – Farm Bill Financial Assistance Programs

NRCS7 – Resource Conservation and Development (RC&D)

NRCS8 – State Technical Committee

NRCS9 – Hire-the-Fisher Habitat Restoration Program

NRCS10 – Cooperative River Basin and Small Watershed Program

NRCS11 – Assistance and Guidance

Federal Highway Administration

FHWA1 – Culvert Repair and Modification

Bonneville Power Administration

BPA3 – Funding for Habitat Project Placeholder

BPA9 – Access to Computer and GIS Data Bases

Federal Water Policy

Federal water quality policies mandate and provide authority for state and local water quality regulations. The 1972 Clean Water Act (CWA) and its subsequent amendments and the 1990 Coastal Zone Management Act Reauthorization Amendments established the major federal guidelines on water quality control throughout the country. State and local authorities implement provisions of these policies in the Tillamook Bay Watershed primarily through the management mechanisms discussed throughout this chapter.

The Clean Water Act

The federal CWA provides the management framework for virtually all local water quality policies and projects. In addition to providing funding for water quality enhancement programs and projects, the Act mandates the creation and enforcement of water quality standards.

Water Quality Standards

Section 303 of the CWA requires states to set water quality standards for the protection of existing and designated beneficial uses for surface water bodies. In Oregon, the Environmental Quality Commission (EQC) sets these standards on all water quality parameters including temperature,

turbidity, pH, dissolved oxygen, bacteria, biological criteria, and habitat modification.

Section 303 (d) of the Clean Water Act requires states to develop a list of water bodies that do not meet U.S. Environmental Protection Agency (EPA) standards for the water quality parameters listed above. In the Tillamook Bay Basin, stream reaches are currently 303(d) listed for bacteria, temperature, sedimentation, and habitat modification. The DEQ also lists "water bodies of concern," where more data are needed to establish failure to meet water quality standards. Many local stream reaches are listed as "of concern" for parameters including: flow modification, habitat modification, sedimentation, nutrients, dissolved oxygen, and pH. The DEQ is presently monitoring water bodies throughout the Watershed to collect the data needed to clarify their 303(d) status.

Total Maximum Daily Loads

For these 303 (d) listed stream reaches, the CWA further requires states to develop water quality management strategies known as Total Maximum Daily Loads (TMDLs). TMDLs address the sources and degrees of pollution in 'water quality limited' streams, rivers, and lakes. Specifically, they (1) provide strategies to reduce chemical, nutrient, and sediment loading as well as physical inputs like sunlight where necessary, and (2) set daily limits on the amount and type of pollutants that can enter the stream. According to the DEQ's *Guidance for Developing Water Quality Management Plans that Function as TMDLs*, "a TMDL addresses pollution problems by systematically identifying problems, linking them to watershed characteristics and management practices, establishing water quality improvement objectives, and identifying and implementing new or altered management measures designed to achieve those objectives." They also include enforcement mechanisms when sources violate load allocations. DEQ will publish draft temperature and bacteria TMDLs for the Tillamook Basin in 1999.

Coastal Nonpoint Pollution Control Program

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires states with Coastal Zone Management Plans to develop and implement programs to control sources of nonpoint pollution which impact coastal water quality. The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA) provided guidance to the states on program development and approval in January 1993. Coastal states are to implement a set of management measures based on guidance published by EPA. The guidance contains 56 management measures separated into six groups: agricultural activities, forestry activities, urban areas, marinas, hydromodification activities, and protecting wetlands.

Oregon Department of Environmental Quality (DEQ) and Department of Land Conservation and Development (DLCD) have joint responsibility for coordinating the implementation of Section 6217 of CZARA. With assistance from other state agencies, DEQ and DLCD submitted the Oregon Coastal Nonpoint Pollution Control Program, (CNPCP) to NOAA and EPA in July of 1995. Oregon's CNPCP submittal described existing programs and proposed work tasks that would meet the terms of CZARA and EPA's guidance and work to improve water quality in Oregon's coastal management area. Current state water quality, wetland, and land use laws, as well as the Forest Practices Act and the early development of The Oregon Plan for Salmon and Watersheds insured that the state already met many requirements of CZARA. In January 1998, after reviewing the state's program submittal, EPA and NOAA returned their findings to the state, granting conditional approval to Oregon's program. The findings included 13 conditions of approval.

DEQ and DLCD divided the approval conditions into 40 discrete tasks. Of these tasks, approximately 25% had been addressed to the satisfaction of EPA and NOAA as of March 1999, although documentation of these resolutions has not yet been formalized. With the help of partner agencies (such as the Oregon Department of Transportation and the Department of Agriculture), who participated in development of the original submittal, the remaining 75% have been prioritized within the framework of the state's larger water quality and salmon recovery efforts.

Oregon plans to implement some CNPCP Management Measures through Water Quality Management Plans being developed as required by the TMDL process, the agricultural water quality plans (SB 1010 rules) and the State Forest Practices Act in the following Oregon Plan priority basins: Umpqua, Rogue, South Coast, and Tillamook/North Coast.

Oregon Statewide Land Use Planning

In 1973, the Oregon Legislature adopted Senate Bill 100, which enacted the statewide land use planning program. Oregon's Department of Land Conservation and Development (DLCD) administers the program through a system of planning goals and guidelines that mandate communities and counties to meet certain land use requirements. Tillamook County and its incorporated communities administer statewide goals through locally developed, adopted and enforced comprehensive plans and implementing ordinances, including those that regulate development within wetland, riparian, and estuarine areas. Enforcement is also provided by the COE and DSL, which administers pass-through grant funds to local governments to complete local wetlands inventories under Goal 5.

Resource Management

Lowland and Floodplain

Lowland areas have been altered as a result of urbanization and the conversion of lowland areas to pastureland. This section discusses the current policies that manage the use and conservation of resources located in the lower basin. Specifically, it summarizes:

- wetland conservation,
- water quality management on agricultural lands,
- riparian management, and
- flood control.

Wetlands Conservation

Most of the basin's wetlands have been lost to conversions for human use. Efforts to conserve remaining wetland habitats focus on local land use regulation, removal-fill laws, and restoration incentives.

Land Use Planning

The Tillamook County Comprehensive Plan maps and identifies significant wetland areas as mandated by Statewide Land Use Planning Goal 5 (freshwater) and Goal 17 (coastal). The Tillamook County Land Use Ordinance protects these significant areas from development by permitting development only if it will not result in major impacts to the wetland areas. Municipalities' regulations may or may not necessarily concur with the State's Goals.

Removal-Fill Permits

Regardless of whether local jurisdictions identify wetlands as "significant," all wetlands actions fall under the jurisdiction of the Oregon Division of State Lands (DSL), U.S. Army Corps of Engineers (COE), and EPA. Because of the extent of wetland loss in the basin and elsewhere, these agencies place increasingly stringent regulations on wetland alteration. In addition, the U.S. Department of Agriculture (USDA) offers incentives to landowners to enhance degraded habitats on agricultural lands.

Under Section 404 of the CWA, fill activities affecting "waters of the United States" require a permit from the COE. Oregon's Removal and Fill Law requires authorization for any activity which removes 50 or more cubic yards of material per year from state waters and/or places an equal amount into state waters. Although removal-fill activities affect more than just wetlands (rivers, streams, lakes, and bays also fall under this law), this policy is vital in restricting major wetland conversion activities.

Both COE and DSL issue permits (called "Nationwide Permits" and "General Authorizations," respectively) which release an applicant from applying for "small" jobs. The NMFS, U.S. Fish and Wildlife Service (USFWS), DEQ, and ODFW review proposed projects' impacts on fish and wildlife habitats.

The DSL recently designated essential salmonid habitat (ESH) for wild salmonid runs in Oregon. The designation protects rearing and spawning (but not migratory) areas for native runs by requiring removal-fill permits for most instream activities, regardless of size.

Restoration Incentives

The federal government has made an effort in recent years to focus funding on wetland restoration activities. The most prominent include USDA Farm Bill and CWA funding.

Wetlands Reserve Program (WRP). Administered by the Natural Resource Conservation Service (NRCS) and Farm Services Agency (FSA), the WRP is a voluntary program under the USDA Farm Bill through which landowners receive payment for permanent or 30-year conservation easements. The program also offers cost-share for wetlands restoration.

Wildlife Habitat Incentives Program (WHIP). WHIP is a voluntary, incentive-based program designed to help private landowners improve fish and wildlife habitat. Under WHIP, landowners create and implement habitat development plans with technical and financial assistance from the NRCS.

Clean Water Act 319 Funds. Established by the CWA Amendments of 1987, the 319 program provides money to states to implement "on-the-ground" projects which will improve water quality through the reduction of nonpoint source pollution. Funding is not directed solely toward wetland areas. Managers in the basin use a significant portion of 319 funding to prevent and treat pollution by supporting wetland projects.

The State of Oregon also assists with wetland projects through the ***Wetland Mitigation Banking Revolving Fund***, which DSL administers, providing grants for wetland restoration and enhancement projects.

Water Quality Management on Agricultural Lands

In recent years, water quality has become an important farm management issue. The Oregon Department of Agriculture (ODA) is improving stewardship on agricultural lands through increased Confined Animal Feeding Operation (CAFO) inspections and Senate Bill (SB) 1010 Agricultural Water Quality Management Area Plans. NRCS and Tillamook County Soil and Water Conservation District (SWCD) efforts also demonstrate the agricultural community's increased emphasis on water quality.

Confined Animal Feeding Operations (CAFOs)

Within the Tillamook Bay Watershed, Confined Animal Feeding Operations (CAFOs) are the primary agricultural activity. Statewide, the ODA manages CAFOs through permits and periodic inspections. Recently, the agency located an additional inspector in Tillamook to ensure operator compliance with CAFO permits in the North Coast Basin.

Senate Bill 1010

The ODA plays a vital role in the implementation of the Healthy Streams Partnership agreement through Senate Bill 1010. Under SB 1010, ODA works with farmers, ranchers, and other parties to develop Agricultural Water Quality Management Area Plans for regions that contribute to water quality limited streams (or wherever a water quality management plan is required by law). Focusing exclusively on agricultural lands and practices, SB 1010 responds to TMDL requirements assigned to agricultural lands. Due for completion in the spring of 1999, the goal of the North Coast Basin plan will be "to prevent and control water pollution and soil erosion from agricultural activities in order to achieve water quality standards."

Like TMDLs developed by DEQ, Agricultural Water Quality Management Area Plans identify the factors contributing to agricultural nonpoint source pollution, recommend measures to correct them, and provide enforceable pollution prevention control measures. Once completed, all farm operations within a basin plan's range must comply with its provisions. The basin plan provides flexibility in the specific management measures operators use to meet the plan's conditions.

Individual Farm Plans. Since 1980 and the beginning of the Tillamook County Rural Clean Water Project, NRCS and SWCD have worked with CAFO and other farm operators to reduce contamination from agricultural lands. Currently, implementation of the North Coast Basin SB 1010 Plan depends upon these agencies' commitment to work toward the development of voluntary farm management plans that adhere to the conditions of the North Coast Basin Plan.

The SWCD, NRCS, and FSA help operators develop and finance their plans. To varying degrees, plans typically follow a template that ODA includes in the SB 1010 Plan.

Environmental Quality Incentives Program (EQIP): As part of the USDA Farm Bill, EQIP allows NRCS and FSA to provide planning, technical, and financial assistance to help agricultural landowners develop farm management plans. The program provides incentives like technical assistance, payments, and cost sharing to improve manure management, and institute erosion control and other practices which benefit water quality.

Methane Energy and Agricultural Development Project

The Methane Energy and Agricultural Development (MEAD) project will employ a process of anaerobic digestion of animal wastes to produce biogas which is then used as fuel for a heat and energy production plant. Poised for development, MEAD will convert a portion of the waste produced by Tillamook County's dairy cattle into marketable products including energy, potting soil, soil amendments, and hot water or steam.

Water Quality Management on Developed Lands

Three sources of wastewater from residential, commercial, and industrial lands contribute to degraded water quality in the Bay: wastewater treatment plants, stormwater runoff, and septic systems. These are managed and regulated by the DEQ, Tillamook County, and/or the cities of Tillamook, Bay City, and Garibaldi.

National Pollutant Discharge Elimination System (NPDES) Permits

Under the Clean Water Act, NPDES Permits control all point sources discharging into waters of the State. The DEQ administers the NPDES program, which provides the primary regulatory tool for wastewater treatment facilities by limiting the amount of pollutants discharged into state waters. In the Tillamook Bay Watershed, six treatment facilities operate. Four are publicly owned and two privately owned.

Stormwater Control Permits

Under federal law, the DEQ regulates sedimentation from development and construction on parcels of land five acres or larger through stormwater permits. Stormwater permits regulate the escape of sediment from construction and industrial sources. The person or entity responsible for the development must submit an Erosion and Sediment Control Plan to DEQ before construction can begin. The objective of the plan is to minimize the erosion of disturbed land during construction and post-construction activities.

On-Site Sewage Disposal System (OSDS) Management

The Environmental Quality Commission (EQC) established standards for the design, construction, operation, and maintenance of OSDSs. Responsibility for enforcing these guidelines falls to the DEQ, which has contracted local responsibility for permitting, inspections, and certification to Tillamook County. The FDA requires a periodic survey of septic systems near commercial shellfish harvesting water bodies.

Riparian Resource Management

Riparian areas link aquatic and terrestrial habitats as well as upland and lowland areas. Throughout the Watershed, riparian conditions vary due to the intensity of land use and effectiveness of regulations. Tillamook County and the cities regulate riparian alteration, except on agricultural lands (where they regulate only structures) and forested land. On these lands, ODA and ODF have sole authority to establish policies under SB 1010 and through the Forest Practices Act (FPA), respectively. Both the ODA's SB 1010 and Oregon's non-farm/forest riparian policies are summarized below. ODF policy is discussed in the 'Upland Forest' section of this chapter.

Non-Farm and Forest Land

The Tillamook County Land Use Ordinance implements Oregon's Statewide Land Use Planning Goals and defines riparian protection throughout the County's unincorporated areas. Currently, the ordinance defines riparian zones as areas within 50 feet of estuaries, lakes larger than one acre, and the main stems of selected rivers where widths are greater than 15 feet. (Within the Tillamook Bay Watershed these include the Tillamook, Trask, Kilchis, Wilson, and Miami rivers.) The Ordinance designates those streams not listed above but still reaching at least 15 feet in width 25-foot riparian zones. All other perennial streams have 15-foot riparian zones.

The DLCD recently amended its Goal Five (Open Spaces, Scenic and Historic Areas, and Natural Resources) provisions by expanding the required riparian buffer. By the end of 2000, Tillamook County expects to expand its 50-foot buffers to 75 feet, and those designated 25 and 15 feet will become 50 feet. In addition to restricting development, the ordinances also protect riparian vegetation by prohibiting removal of trees or more than 50% of the understory vegetation within the riparian area. The incorporated cities have adopted similar land use ordinances, updating them at their own pace.

Floodplain/Lowland Pastures

SB 1010 water quality management plans place increased emphasis on riparian restoration in agricultural lands. Although the North Coast Basin plan will not mandate riparian restoration, management measures it establishes should improve riparian zones over the long term. The SB1010 process defines pollution prevention and management control measures (PCMs) to improve water quality and enhance riparian areas to a healthy riparian condition (HRC).

The Conservation Reserve (Enhancement) Program. The Conservation Reserve Program (CRP) provides rental payments to agricultural landowners for conserving riparian buffers. However, local landowners have not applied for CRP funding because rental payments do not match the value of pastureland. The USDA has funded Oregon under the Conservation Reserve Enhancement Program (CREP). Designed to increase CRP payments to landowners, CREP funds may increase the usage of CRP in the basin.

Lowland Flood Control

Lowland habitats have been severely altered due to structural flood control tools utilized to create and maintain pastureland. Structural flood control involves levees, dikes, and, until the 1970s, channel dredging. Tillamook Bay's floodplain has an extensive system of levees and dikes created by a patchwork of independent diking districts. This system effectively controls daily flooding of tidal marshes and annual flooding of floodplains.

Project Impact

The Federal Emergency Management Agency (FEMA) in June 1998 designated Tillamook County as a Disaster Resistant Community under its Project Impact program. Project Impact constitutes an effort by FEMA to enable natural disaster-prone communities to better safeguard against loss of life and property during major events. A community-based approach, it provides seed money for communities to leverage private and public funds to finance disaster mitigation projects.

Habitat Restoration and Flood Mitigation Activities

The Corps of Engineers (COE) initiated and funded a Reconnaissance Study in March 1998 to determine their interest in funding a detailed feasibility study of flood mitigation and ecosystem restoration activities in Tillamook basin. If further studies are justified and supported by the community, the COE will prepare a scope of work and cost-sharing agreement with a non-federal sponsor. A multi-year feasibility study would identify and design specific flood mitigation and habitat restoration projects within the Watershed. Raising the 50% local match for the $3

million feasibility study and model is a major stumbling block, and the Tillamook County SWCD, as the local sponsor, is seeking State help.

WRDA 99 Program

Specific projects determined through the feasibility study may be implemented under the "WRDA 99" program. This COE initiative under the Clean Water Action Plan aims to mitigate the impacts of flooding while restoring wetland and riverine habitats. The COE has identified Tillamook Bay as a priority area for study. If implemented locally, WRDA 99 measures will likely include floodplain restoration; house-raising and relocation from floodways; selective and voluntary dike modifications and/or setbacks; and other mitigation and restoration activities. The federal government is presently considering WRDA 99 for adoption.

Tillamook County Flood Hazard Mitigation Plan

In October 1996, Tillamook County's Board of Commissioners adopted a comprehensive Flood Hazard Mitigation Plan (FHMP). The goals of the FHMP are to reduce: 1) flood hazards and damage, 2) the environmental impacts of flooding, and 3) the long-term costs of flood control and floodplain management. The FHMP recommends a suite of activities to achieve its goals:

- structural capital improvement projects;
- relocation and elevation projects;
- maintenance and monitoring;
- river planning; flood warning and emergency response;
- complaint response and enforcement; and
- intergovernmental coordination.

The FHMP and CCMP include similar objectives, including managing floodplains, rivers, streams, and other water resources for multiple uses, such as flood and erosion hazard reduction, fish and wildlife habitat, and water supply.

National Flood Insurance Program

Tillamook County participates in the National Flood Insurance Program (NFIP). The NFIP, established by Congress in 1968, provides low-cost flood insurance within communities with approved flood control programs. Tillamook County has had an approved program since 1978. In 1997, 1,099 flood insurance policies provided $122 million in total coverage in Tillamook County.

Tillamook County Flood Hazard Ordinance

To be eligible for the NFIP, Tillamook County passed a flood hazard ordinance consistent with the NFIP. A principal tool for flood regulation is the Flood Hazard (FH) Overlay Zone, contained in the County Land Use Ordinance. The FH Zone restricts any uses that threaten community health and safety as a result of flood or erosion and requires flood damage protection for uses within the zone. The FH Ordinance also regulates the alteration of floodplains and construction or alteration of barriers to flood water within the Overlay Zone.

Because of the complexity of the flood problems in the City of Tillamook and tidal effects on flooding, no floodway was established as part of the federal flood insurance study. The methods for delineating floodways do not apply in this case, because flood waters flow in many directions: away from the river channel, down the river channel; and around log and debris jams. Tillamook Bay tidal action, which complicates and increases flood hazards, cannot be incorporated in available floodway procedures. As a result, no floodway restrictions exist on building in these areas.

Other Local Efforts

The Tillamook County SWCD can legally engage in flood control projects, but to date has not done so. Recently, the Tillamook County Flood Control Group has led a citizens' movement to create a Tillamook County Flood Control District. The group did not place a referendum on the November 1998 ballot, though it may do so in 2000.

Upland Forest

Forest Management Regulations

Eighty-nine percent of the Tillamook Bay Watershed is forested. The Oregon Department of Forestry regulates operations on all non-federal forest lands under the Oregon Forest Practices Act (FPA), which establishes standards for forest management operations. These standards are designed to limit the impact of forest operations on water quality and fish and wildlife habitats. ODF will soon manage Tillamook State Forest lands under its Northwest State Forest Management Plan and – if implemented – the Western Oregon State Forests Habitat Conservation Plan (HCP).

The Forest Practices Act

The Forest Practices Act (FPA) of 1971 was the State's first effort to use Oregon Administrative Rules (OARs) to comprehensively regulate forest management activities. The periodically-revised FPA regulates forest practices on both state and private forest land, defining standards for such activities as slash disposal, harvesting, road construction, reforestation, and the application of chemicals. In consultation with other agencies, the Board of Forestry develops and implements all rules relating to these and other issues. The ODF administers the FPA.

Northwest State Forest Management Plan

Due to be adopted in 1999, the Oregon Northwest State Forest Management Plan (OPSW Action ODF-95) provides a long-range vision of the management of State Forest lands, including the Tillamook State Forest, under an approach called "structure-based management." The goal of structure-based management is to selectively harvest forest lands in a manner that provides a diverse forest landscape and creates habitat for all indigenous fish and wildlife species.

Structure-based management. A new approach for State Forest lands called structure-based management (SBM) is a central theme in the development of the Northwest Oregon State Forest's Long Range Management Plan. Currently under development, an SBM approach would include a mix of active forest management techniques and practices that produce an array of forest stand structures across the landscape. ODF is analyzing four different stand structure targets, and is currently working out the eventual proportion of each structure across the forest, including:

- older forest structure,
- complex stands,
- closed canopy, and
- regeneration areas.

The individual stands themselves would be constantly changing, but the range of stand types and their relative abundance across the forest would be reasonably stable. Because the structures are in a dynamic balance across the landscape, the forest theoretically provides a steady flow of timber volume, jobs, habitats, and recreational opportunities.

Habitat Conservation Plan (HCP)

As part of its Forest Management Plan, ODF is developing the Western Oregon State Forests HCP to comply with the incidental take permit requirements of the ESA. The April 1998 Draft HCP proposes policies and objectives for the management of key habitats throughout much of the upper Watershed. The Draft HCP conserves salmonid habitat mostly through increased riparian protection and improved upland management.

Riparian Management in Upland Forests

Enforced under the FPA, Riparian Management Areas (RMA) provide the most critical salmonid habitat management mechanism established by the ODF. According to the FPA, RMA "widths are designated to provide adequate areas along streams, lakes, and significant wetlands to retain the physical components and maintain the functions necessary to meet the [FPA] protection goals for water quality and fish and wildlife."

Currently, ODF proposes to increase RMA widths in the basin under the Draft HCP. RMAs under the FPA and HCP are discussed below.

Forest Practices Act

The FPA is designed to ensure, to the extent practicable, that forest operators do not impair water quality or fish and wildlife habitat. Table 1-1 summarizes Riparian Management Area widths established under the FPA.

Table 1-1. Riparian Management Area Widths for Streams of Various Sizes and Beneficial Uses

Water Body*	Large	Medium	Small
Type F	100 feet	70 feet	50 feet
Type D	70 feet	50 feet	20 feet
Type N	70 feet	50 feet	**

* F=Fishbearing, D=Domestic use, N=Non fish bearing

**Any specified water quality protection measures, and see OAR 629-640-200.

Source: Oregon Forest Practices Administrative Rules and Abridged Forest Practices Act, January 1997. (OAR 629-635-310)

Habitat Conservation Plan. The April 1998 Draft HCP proposes adaptive management standards that emphasize the protection of aquatic resources. The proposed plan divides RMAs into three terrestrial zones of varying widths: the stream bank zone (high water level to 25 feet), the inner RMA zone (25 to 100 feet for Type F streams, 25 to 85 for Type N), and the outer RMA zone (100 to 170 feet for Type F, 85 to 170 for Type N). Specific management standards on operations within each of the RMA zones vary significantly based on fish presence or absence, stream size classification, and (for N type streams) stream function. In sum, the proposed HCP standards will produce enhanced riparian functioning beyond that attained under current FPA standards.

Federal Forest Lands

Bureau of Land Management and U.S. Forest Service lands are governed by the Northwest Forest Plan, originally adopted in 1994 as the federal response to the Endangered Species Act listing of the Northern Spotted Owl. The plan amended the agencies' Land Use Planning and Management Documents, adopting certain best management practices (BMPs), often stricter than those required on state or private land. The two agencies also have their own compliance rules for such federal laws as the Clean Water Act. USFS and BLM efforts which support the CCMP are listed on Pages 3-14 through 3-16.

Water Quality Management on Forest Lands

The FPA provides the fundamental water quality management policy enforced on non-federal forest lands. If implemented, the HCP also contains measures that will improve forest water quality management. Finally, as stated previously, private land owners also undertake activities to improve water quality under the Oregon Plan.

Forest Practices Act

Under Oregon Revised Statutes, the FPA "establishes best management practices and other rules applying to forest practices as necessary to insure that nonpoint source discharge of pollutants resulting from forest operations do not impair [state] water quality." The most significant provisions of the FPA with regard to sediment loading include the regulation of timber harvesting and forest roads.

Timber Harvesting. The FPA establishes standards for forest harvesting that will "maintain the productivity of the forest land, minimize soil and debris entering waters of the State, and protect wildlife and fish habitat." The types of measures defined for timber harvesting include soil protection, the location of trails and drainage systems, the treatment of waste materials, and provisions for maintaining forest productivity and harvesting on high risk sites.

Forest Roads. The FPA manages forest roads to prevent non-point source pollution from entering surface waters by regulating road location, design, construction, and maintenance. Specific examples of provisions include: avoiding road construction on high risk sites, RMAs, and other areas; road, culvert, and crossing design; debris and structure placement; road maintenance and closure requirements; and other provisions.

Habitat Conservation Plan

In addition to habitat conservation strategies aimed at RMAs, the HCP also proposes upland management activities that will reduce sediment loading into surface waterways. These activities focus on the relationship between slope stability and landslides as well as forest roads.

Slope Stability. According to the April 1998 Draft HCP, ODF proposes using risk-based management and site specific BMPs to restore properly functioning landslide processes and, ultimately, to restore and maintain aquatic habitats. Risk-based management principles include establishing a three-level approach to managing slope stability issues. The HCP defines input required from a geotechnical specialist at each of three levels. These include:

- Level I: Programmatic Planning, which requires no specific operations;
- Level II: Intermediate Level Planning, which requires a comparison of risk-based alternatives; and
- Level III: Site Specific Geotechnical Problem Solving, which requires site specific inventory, plans and analyses.

Forest Roads. Fundamental to the restoration and maintenance of aquatic habitats objective is the need to reduce sedimentation caused by road–related landslides and chronic erosion. The April 1998 Draft HCP presents procedures and standards for road system planning, design and construction, maintenance, and closure.

Estuary and Slough

Statewide Planning Goal 16: Estuarine Resources governs Tillamook Bay's estuarine and slough habitats. Tillamook County implements Goal 16 through the county Land Use Ordinance and Comprehensive Plan. The ODA manages shellfish harvests in the Bay.

Estuarine Planning

Goal 16 aims "to recognize and protect the unique environmental, economic, and social values of each estuary and associated wetlands [and to protect, maintain, develop, and restore the benefits of Oregon's estuaries]." Under Goal 16, the State established a coastwide classification system to maintain diversity among the State's estuaries. The classifications include natural, conservation, shallow draft development, and deep draft development. Tillamook Bay is classified as a shallow draft development estuary.

The Tillamook County Comprehensive Plan

The Comprehensive Plan establishes the long range plan for management of the estuary. Despite the Bay's classification as a "development" estuary, the plan emphasizes conservation of the Bay's resources and the long-term stability of life that depends on it. This is reflected in the ordinances that govern the Bay, and the land use map that designates much of the Bay as "estuary natural." See Figure 4-11. Classifications under the Tillamook County Land Use Ordinance include:

Estuary Development (ED). ED areas are "designated for navigational and other water-dependent commercial, industrial, or recreational uses." Habitat features are considered to be minimal. This zone is only found in and around development near the Bay.

Estuary Conservation 2 (EC2). EC2 areas "provide for long-term use of renewable resources that do not require major alterations of the estuary except for purposes of restoration." Habitat areas are recognized as partially altered and do not qualify for inclusion in EC1 or EN.

Estuary Conservation 1 (EC1). EC1 areas are designated to

1) "provide for long-term utilization of areas which support, or have the potential to support valuable biological resources, and
2) provide for long-term maintenance and enhancement of biological productivity and aesthetic values."

EC1 areas possess significant habitat values in the forms of tidal marshes, tideflats, seagrasses, and algae beds. This zone comprises much of the interface between terrestrial and aquatic habitats.

Estuary Conservation Aquaculture (ECA). "The purpose of the ECA Zone is to promote the continuing utilization of designated shellfish culture areas, while providing for low-intensity, water-dependent recreation, commercial and recreational fishing and crabbing." Habitat values are recognized as high and are protected for "scientific, research or educational purposes."

Estuary Natural (EN). EN areas are designated to "provide for preservation and protection of significant fish and wildlife habitats and other areas which make an essential contribution to estuarine productivity or fulfill scientific, research or educational needs." Most of Tillamook Bay is classified EN except for a significant tract of ECA in the Main Bay and ED zones near urbanized areas.

Dredging

Federal dredging by the U.S. Army Corps of Engineers (COE), which began in the mid-1890s, was once common in the lower Bay. Channels to Bay City and Tillamook were maintained for shallow draft commercial vessels. The lower Wilson and Trask rivers were dredged in 1972 in an attempt to reduce flooding. Citizen observations during the December 1972 floods indicated the dredging may have been helpful, but no objective data are available to evaluate the effect of the channel dredging. The COE suspended dredging outside the Garibaldi area shortly thereafter, because channel dredging could not prevent the effects of tidal flooding, and because natural sedimentation would refill the dredged areas every year. Still, some speculate that constricted channels are contributing to increased flooding.

The Oregon Shellfish Program

Shellfish harvesting is an important local industry and relies on the sustained health of the Bay. The ODA administers the Oregon Shellfish Program which manages commercial shellfish harvesting throughout the state. Under Oregon Administrative Rules, this program adopts the standards set for acceptable bacterial concentrations established in the FDA's National Shellfish Sanitation Program.

Slough Habitats

Many sloughs suffer from low levels of dissolved oxygen, elevated temperatures, and bacterial contamination. However, because most sloughs in the basin run through agricultural lands (pastures), the County is not permitted to regulate their management. ODA will address sloughs, like rivers, in the North Coast Basin Agricultural Water Quality Management Area Plan (SB 1010). See Resource Management discussion for Lowland and Floodplain, this chapter.

Opportunities for Improvement

This section summarizes potential weaknesses of the current management framework and suggests opportunities for improvement. Organized by the section headings found throughout the chapter, recommendations highlight areas wherein management changes will improve the conservation of basin resources and produce significant improvements in salmonid habitat, water quality, sedimentation and erosion, and flood mitigation. Each identified problem includes relevant actions proposed in the CCMP.

Wetland Conservation

Enforcement of land use laws. Water quality and salmonid habitat will benefit substantially from improved enforcement of land use regulations.

HAB-16 Effectively Enforce Land Use Laws and Regulations

Land trust funding. Many key habitats could be preserved under a land trust. Tillamook Bay needs to work with a habitat conservation organization (*e.g.*, Central Oregon Coast Land Conservancy, The Nature Conservancy, or Oregon Natural Heritage Program) to manage lands with conservation easements or lands that are purchased.

CIT-06 Establish a Land Trust or Conservation Organization

Water Quality Management on Agricultural Lands

Livestock access. Sufficient provisions are not in place to control livestock access to streams and riparian areas.

HAB-09 Control Livestock Access to Streams

CAFO inspections. Not all CAFOs can be inspected annually, with only one CAFO inspector covering nearly 200 CAFOs in a 5-county area (including Tillamook County).

WAQ-03 Implement Revised Confined Animal Feeding Operation (CAFO) Inspection Procedure

Farm operations. Farms have a significant impact on the natural environment, and operators should be up to date on the newest stewardship practices.

WAQ-05 Provide Farm Management Training Programs

Water Quality Management on Urban Lands

On-site sewage disposal systems. Increased monitoring of OSDS is needed to ensure they are not polluting ground and surface waters with fecal bacteria and nutrients.

WAQ-09 Ensure Properly Functioning On-Site Sewage Disposal Systems

Urban development. Erosion control on development is established only for projects greater than five acres. Those under five acres, which are not regulated, also produce significant sedimentation.

SED-06 Develop, Implement, and Enforce a Stormwater Management Ordinance.

Riparian Resource Management

Livestock access. Sufficient provisions are not in place to control livestock access to streams and riparian areas.

HAB-09 Control Livestock Access to Streams

Government lease incentives. Under USDA/NRCS lease and technical assistance programs, incentives are often inadequate compensation for the lost pasture.

HAB-13 Increase Incentive Program Payments

Lowland Flood Control

Floodplain mapping. Future flood mitigation and habitat improvement efforts will be hampered without a better understanding of floodplain dynamics and hydrology.

FLD-01 Develop a GIS-Based, Unsteady State Hydrodynamic Model

Floodplain alterations. Alterations to the basin's floodplains have reduced lowland habitats and exacerbated flooding. In addition, many past flood control measures degraded or destroyed critical aquatic habitat.

FLD-02 Implement Watershed Drainage Modification Projects

FLD-05 Regulate New Construction and Development in the Floodplain

FLD-06 Clear Mapped Lowland Floodways or Floodplains of Hazardous Materials

Flood impact mitigation. Many houses, businesses, and farms are located in flood-prone areas creating significant loss of property during flood events.

FLD-03 Elevate and/or Relocate Structures, Livestock, and Equipment

Upland Forest Resource Management

Forest Practices Act enforcement. Increased enforcement of forest operations would ensure complete compliance with the FPA and may reduce sediment loading in rivers.

SED-04 Ensure Sufficient Resources to Enforce Forest Practices Act

Water Quality Management on Forest Lands

Forest road management. Many forest management roads were built to channel water quickly to streams and rivers. This artificial drainage system quickens the flow of rainwater to the lowlands, increasing flood hazards. In addition, upland streams have been cleaned of debris to facilitate fish migration, which also increases flow.

FLD-01 Develop a GIS-Based Unsteady State Hydrodynamic Model
FLD-02 Implement Watershed Drainage Modification Projects
SED 01 Implement Road Erosion and Risk Reduction Projects
SED-02 Implement Practices That Will Improve Sediment Storage and Routing
SED-03 Reduce Risks in Landslide-Prone Areas
HAB-03 Prioritize Upland Protection and Enhancement Sites
HAB-05 Protect and Enhance Upland Riparian Habitat

Estuary and Slough Resource Management

Estuary management (County). The County's estuary planning (the Tillamook County Comprehensive Plan and Tillamook County Land Use Ordinance) does not reflect up-to-date research and data. Current estuary management policies use data developed in the 1970s.

HAB-23 Update the Estuary Plan and Zoning

Large wood. Insufficient efforts are being made to protect and enhance large wood in streams, rivers, and the estuary.

HAB-15 Revise Local Ordinances to Increase Protection of Riparian Areas, Wetlands, and Instream Habitat
HAB 22 Enhance Large Wood in the Estuary

Shellfish harvesting. Bay monitoring strategies have been revised since the last shellfish management plan was developed in 1991. The DEQ, ODA, and the TBNEP conducted an intensive study of a spring runoff event in March of 1998. This data and other TBNEP research regarding bacterial loading and fate in the Bay should improve the comprehensiveness of the management plan.

WAQ-12 Evaluate Shellfish Growing Area Classifications
WAQ-13 Update Shellfish Management Plan Closure Criteria