
INTRODUCTION

Tillamook Bay National Estuary Project

In April 1992, Oregon Governor Barbara Roberts nominated Tillamook Bay to the National Estuary Program (NEP). In her nomination, the Governor characterized Tillamook Bay as representative of the bays along the Pacific Northwest coast because it provided a vital resource to the local and regional economies, and supported diverse aquatic resources including anadromous fish, shellfish, and waterfowl.

In supporting the nomination, Oregon Department of Environmental Quality (DEQ) Administrator Fred Hanson underscored three environmental problems facing Tillamook Bay:

- *Bacterial contamination that causes periodic closure of Tillamook Bay shellfish harvest;*
- *Excessive sedimentation that has reduced the volume of the Bay, adversely affected fish and wildlife habitat, and decreased the available area for recreational and commercial boating; and*
- *Declining salmon and trout runs due to degradation of spawning and rearing habitat.*

As the various management plans for Tillamook Bay Watershed are implemented, their results monitored, and additional scientific information gathered, this CCMP will evolve. Like the Bay, the CCMP is living and changing.

Like Governor Roberts, Mr. Hanson also noted the very concerned and active community of Tillamook Bay, and recognized a "history of working together to take action to address its problems."

Governor Roberts and Mr. Hanson promised that if selected for the National Estuary Program, a "...Management Conference will develop a plan for the Bay that will maintain and improve water quality and living resources, while ensuring compatibility with Tillamook County's economically important industries."

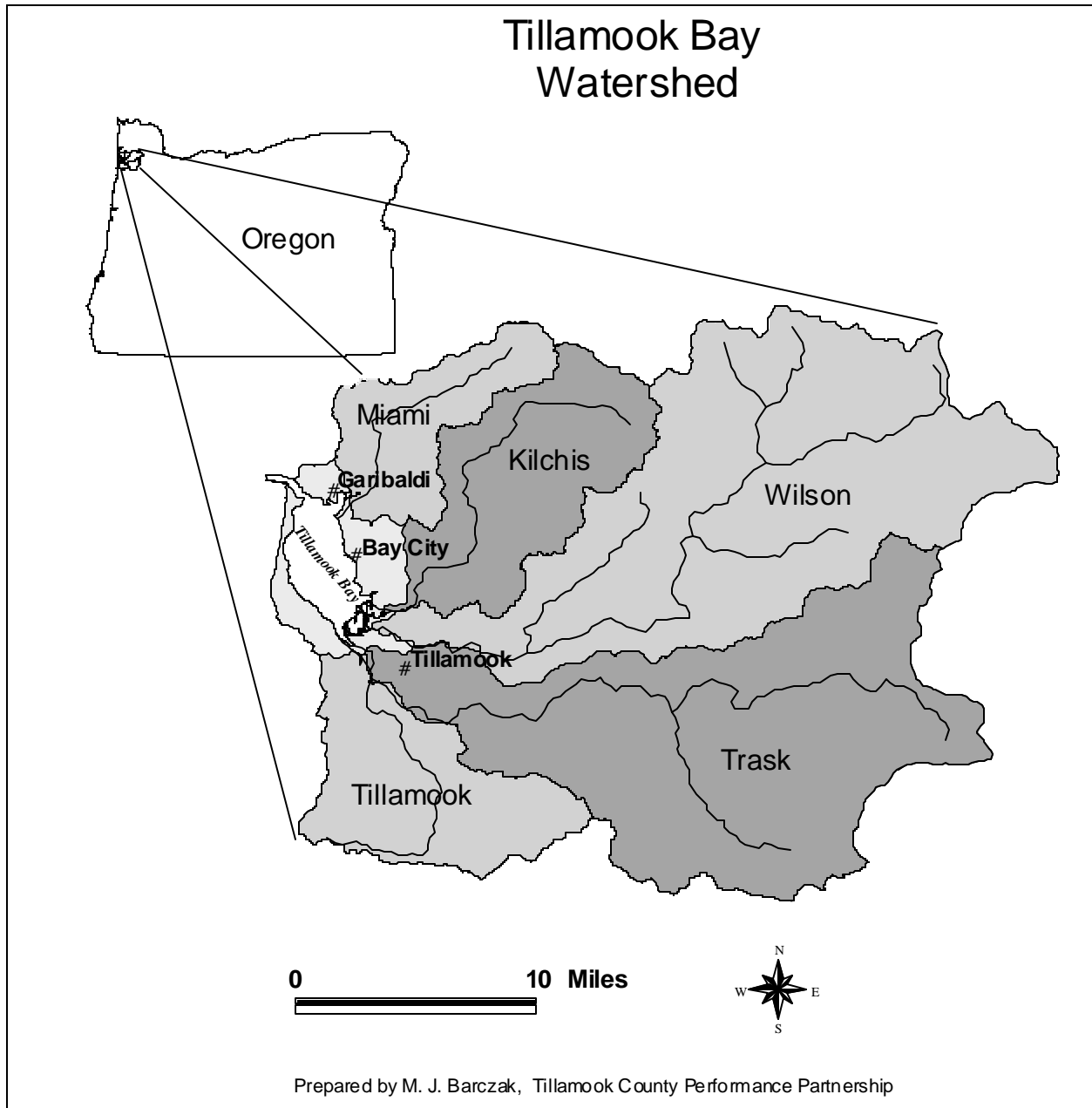


Figure 1-1. Map of the Tillamook Bay Watershed in Tillamook County, Oregon. It includes the watersheds of five rivers: the Miami, Kilchis, Wilson, Trask and Tillamook.

Tillamook Bay's nomination was approved, and seven years later, this Comprehensive Conservation and Management Plan (CCMP) fulfills the commitments made in 1992. It represents the collaborative work of the many citizens, managers, scientists, educators, and political leaders who supported the project over these years. The CCMP sets forth a 10-year action plan to coordinate resources, strengthen commitments, and rededicate our resolve to protect and enhance Tillamook Bay's natural resources.

About the TBNEP

In 1987, Congress established the National Estuary Program (NEP) as part of the Clean Water Act. The NEP's mission is to protect and restore the health of estuaries while supporting economic and recreational activities. The U.S. EPA administers the program. In 1994, TBNEP joined 27 other National Estuary Projects around the United States in developing and implementing science-based, community-supported management plans. To achieve program objectives and to complete a credible management plan, the TBNEP organized a Management Conference made up of policy makers, agency managers, citizens, and leading scientists from local, state, and regional institutions. The Management Conference established four committees to provide vital links in a cooperative effort to solve the environmental problems confronting the Tillamook Bay Watershed and its people.

Policy Committee

Composed of local, state, and federal leaders, the Policy Committee provided overall direction and set priorities for the program, defined Management Committee membership, and selected the Project Director.

Management Committee

Citizen leaders and agency managers, the majority of whom live and work in the Tillamook Bay Watershed, comprised the Management Committee. This group refined the definitions of Watershed problems and developed strategies to solve them. They also oversaw scientific characterization of the resources, completed action plans for the CCMP, and developed institutions and programs to implement the plan.

The Scientific and Technical Advisory Committee (STAC)

Represented by scientists, engineers, and planners from local and regional agencies and universities, the TBNEP STAC guided the environmental characterization of the Watershed and oversaw relevant activities. It provided research recommendations, reviewed findings and results, and worked to clarify sources of problems and identify practical solutions. The STAC steered Geographic Information Systems (GIS) and modeling efforts, and helped outline the monitoring strategy to track management effectiveness.

The Citizen Action Committee (CAC)

Drawn from citizen leaders and educators, the CAC worked to inform the public and develop strategies to involve all citizens in the decision-making

process. The Committee oversaw the production of newsletters, videos, posters, and signs. It helped develop relevant educational programs and conducted many public meetings and forums to solicit public input and support the consensus process. The CAC worked to educate citizens, to listen to their problems and ideas, and to provide them with the tools and information to make good decisions.

Management, Science, and Citizen Wisdom

The committees in the Management Conference worked together to integrate good management, sound science, and solid community support into the final CCMP. The entire CCMP development process took about five years and countless hours of meetings and discussions.

The TBNEP began in 1994 with three priority problems. After considering new scientific information and intervening events, including the Flood of 1996, the Management Committee rewrote the priority problems and added a fourth: flooding.

- *The interaction of human activities with dynamic natural systems has increased the magnitude, frequency, and impacts of flood events. These events affect water quality, cause erosion, imperil fish and aquatic wildlife, destroy property, and threaten life.*

The Management Committee developed the CCMP, which contains action plans for all four problems, against the backdrop of other planning efforts. As a comprehensive management plan, the CCMP incorporates many Clean Water Act-related components of these other plans, and establishes a process to continue to coordinate all agency workplans. Other concerns (*e.g.*, social and economic) are only addressed here in the context of the Clean Water Act. Specific resource management plans relevant to Tillamook Bay and Northwestern Oregon include:

- ***The Oregon Plan for Salmon and Watersheds (OPSW)*** mission is to restore our native fish populations – and the aquatic systems that support them – to productive and sustainable levels that will provide substantial environmental, cultural, and economic benefits. This sweeping plan relies on the cooperation of private citizens, industry, and all of Oregon’s resource agencies. Watershed councils and the development of watershed assessments are critical to the success of the OPSW. Several watershed assessments have been completed in the County with the assistance of the TBNEP.

- ***The Tillamook County Flood Hazard Mitigation Plan*** was developed after severe flooding in 1996. It recommends strategies to reduce the occurrence of – and damage caused by – major flood events.
- ***The Tillamook County Comprehensive Plan*** and the implementing Land Use and Land Division Ordinances were prepared and adopted by Tillamook County in compliance with *Oregon’s Statewide Planning Goals and Guidelines*, statutes, and administrative rules. The Comprehensive Plan and implementing ordinances provide findings, policies and regulations that protect resource lands and manage growth in Tillamook County.
- ***The Oregon Northwest State Forest Management Plan*** provides a long-range vision of the state forests and proposes an approach called “structure based management” which diversifies forest stands and habitat types. *The Western Oregon State Forests Habitat Conservation Plan* is being developed in conjunction with the State’s Northwest Forest Management Plan to provide long range strategies for the management of endangered and threatened animal species in state forests.
- ***Total Maximum Daily Loads (TMDLs)*** are water quality plans/regulations that DEQ writes for water bodies which do not meet the Clean Water Act water quality standards. Currently, DEQ is writing several TMDLs for Tillamook County.
- ***Oregon Senate Bill 1010 (SB 1010)*** mandates area water quality management plans for agricultural regions. Because the Tillamook Bay Watershed is viewed as a high priority area, the local advisory committee is already designing the North Coast Basin SB 1010 Plan.
- ***The President’s Northwest Forest Plan*** provides a long-range vision of federal forest lands in the Pacific Northwest. It includes standards and guidelines emphasizing sustainable forest practices which provide for the long term health of Northwest forest ecosystems.

Chapter 3, Management Framework provides more information on these plans, policies and programs. Citizens, stakeholders, and agency representatives on the Management Committee – and corresponding committees of other groups and agencies – worked to integrate these efforts into a coordinated CCMP that spans all agencies working in the Watershed. However, genuine cooperation requires more than a document; it also requires a well-managed implementation process.

The Tillamook County Performance Partnership succeeds the existing structure of the TBNEP, assuming responsibility for CCMP implementation. Led by the NEP and a consortium of stakeholders, this new County department will

continue to bring together all relevant federal, state, and local agencies, and watershed councils into a committee structure that makes collaborative decisions over resource management strategies and priorities. See Chapter 8, Implementation and Finance.

CCMP Development Process

Over the past four years the Management Conference worked to integrate recent scientific findings, refine citizen input, and coordinate agency mandates into a comprehensive management plan. The formal CCMP development process boiled down citizen input to 63 Management Committee actions to solve the four priority problems in the Watershed and strengthen citizen involvement in the effort.

In year three of the program, the TBNEP invited citizens to recommend actions and strategies to address the priority problems. Under leadership of the CAC, TBNEP received over 200 recommended citizen actions to solve local problems. By July 1997, CAC refined the list to 25 high priority citizen actions, listed on Page 1-14, and submitted the list to the Management Committee for consideration and review.

By soliciting public input early, CCMP development followed a "bottom-up" approach to environmental management. Although the process endured some bumps and frustrations along the way, the TBNEP emphasis on citizen involvement led the way for watershed councils and supported the voluntary approach of the Oregon Plan for Salmon and Watersheds (OPSW). Both the CCMP and the OPSW share a vision of responsible and knowledgeable citizens solving their own environmental problems.

The Management Committee organized subcommittees to address each of the four priority problems: key habitat, water quality, sedimentation, and flooding. These subcommittees responded to original citizen recommendations and organized actions to correspond to agency programs and mandates.

At the same time, the TBNEP conducted more than four years of scientific and technical studies. Under STAC leadership, staff gathered existing technical information while academic and agency scientists worked to fill gaps in the knowledge base. The initial characterization identified about 250 miles of salmon core areas and identified key habitats and living resources in the estuary. Other studies mapped roads, landslides, and vegetation in the upper Watershed. Later scientific findings provided additional information about the sources and loading rates of bacteria and sediments to the estuary. The resulting information, summarized in the *TBNEP Environmental*

Characterization Report (TBNEP 1998), provides a solid framework for scientific analysis and policy decisions, and simplifies public access to land use information. To ensure public access, these data are available via the World Wide Web and on Geographic Information Systems (GIS) layers at the Tillamook Coastal Watershed Resource Center. The CCMP commits to further developing information resources and other tools that support more informed decision-making by citizens and agencies alike.

After evaluating the scientific-technical information, incorporating citizen input, and reviewing agency authorities, the TBNEP developed a draft CCMP by September 1998. Following a citizen “Listening Post” meeting in October of 1998 and more Management Committee discussion, the CCMP was refined further. TBNEP staff received comments from state and federal agencies through March 10, 1999, and again from the public through April 23, 1999. The final CCMP includes technical revisions, specifications and criteria, and policy recommendations as a result of input from about 40 reviewers. See Appendix P. To focus activities on high-priority actions, the Management Committee ranked individual actions based on environmental benefit and benefit/cost ratios. See Appendix C.

As a result of the environmental characterization phase, TBNEP developed a rich Geographical Information Systems (GIS) database. In spring 1998, TBNEP collaborated with Economic Development Council of Tillamook County (EDCTC), Tillamook County Soil and Water Conservation District (SWCD), and Tillamook Bay Community College (TBCC) to establish the Tillamook Coastal Watershed Resource Center (TCWRC). TBNEP transferred the GIS database to the TCWRC.

The TCWRC and watershed councils are new institutions that will facilitate citizen involvement with CCMP implementation. With support from the Performance Partnership, they will provide public access to habitat maps and geographic information, train citizens in watershed assessment, and support community-based decision-making based on good science and public consensus. In 1998, citizens enrolled in a watershed assessment class at the center and conducted an assessment of the Trask River, one of the first citizen assessments to use the Governor’s Watershed Enhancement Board Watershed Assessment Manual. The recently-formed Tillamook Bay Watershed Council is implementing the action plan developed as part of that effort.

The CCMP encourages all agencies with regulatory responsibilities to more effectively enforce current laws and mandates. For example, the County and cities will protect habitat through stronger enforcement of existing land use laws. They will adopt local ordinances to protect riparian areas and better manage

stormwater runoff. At the state level, Oregon Department of Agriculture promises stronger enforcement of pollution prevention and control measures (PCMs) for agriculture and increased inspections of livestock operations. Oregon Department of Environmental Quality will enforce the Clean Water Act through the Total Maximum Daily Loads and other processes. Oregon Department of Forestry will oversee tough enforcement of the Forest Practices Act. These and other mandates put a heavy burden on state, county and city governments, which often lack resources to fulfill all their responsibilities.

This Document and the TBNEP Action Plan

Chapter 2, State of the Bay, describes the Bay and Watershed, and the four priority problems:

- key habitat,
- water quality,
- erosion and sedimentation, and
- flooding.

Goals and measurable objectives to chart our progress as we implement this Comprehensive Conservation and Management Plan are included for each problem.

Chapter 3, Management Framework, details the policies and programs relevant to this plan.

The TBNEP Action Plan – described in Chapters 4 through 7 – addresses the four priority problems with coordinated goals, objectives, and 63 specific actions. Citizen Involvement gets special attention in Chapter 9, with eight additional actions to ensure and strengthen public involvement. Each action details the steps required to complete the action; identifies coordinating entities, other partners, and completion dates; estimates costs; acknowledges regulatory issues; and plans for monitoring progress toward the CCMP goals and objectives. The actions are cross-referenced with one another, as well as the Oregon Plan for Salmon and Watersheds and other applicable programs and plans. Possible funding sources for each action are listed in Table 8-1 (Chapter 8, Implementation and Finance).

As a comprehensive management plan, the CCMP incorporates many good ideas from at least a dozen relevant resource management plans that focus on some part of the Tillamook Bay environment. Although not all are specifically referenced, the CCMP includes goals and objectives from all these plans and integrates them in a comprehensive, basin-wide vision for performance-based management.

The CCMP includes several types of actions to achieve immediate and long-term goals. It calls for on-the-ground projects to upgrade roads, enhance habitat, reconnect rivers and sloughs, and improve farm practices. The plan also recommends more effective enforcement of environmental laws and ordinances, and outlines actions to build local capacity for better enforcement and education. Other actions define additional needs for continued research and monitoring to track progress in achieving stated objectives. By integrating on-the-ground projects, stronger enforcement, institutional development, and monitoring efforts, the CCMP presents a comprehensive framework that combines local, state, and federal initiatives into a coordinated management plan for the Tillamook Bay Watershed.

The Priority Problems

The TBNEP began in 1994 with three priority problems: water quality, sedimentation, and habitat. After considering new scientific information and intervening events, including the Flood of 1996, the Management Committee rewrote the priority problems to more accurately reflect the current state of the Bay and Watershed, and added a fourth: flooding.

Key Habitat (Chapter 4)

To restore fish and other aquatic species whose populations have declined due to habitat loss or degradation, the CCMP presents an action plan to assess, protect, and enhance key habitats throughout the Watershed. It targets instream and riparian areas, along with tidal marshes and lowland sloughs, as high priority habitats for protection and enhancement. In the forested uplands, the plan commits to remove barriers to fish passage and improve riparian and instream conditions in salmon core areas. It commits to upgrade road culverts and enhance 100 miles of instream habitat by 2010.

In the lowland agricultural areas, the CCMP calls for major riparian enhancement projects designed to control livestock access to streams and improve water quality. It promotes bio-engineered river stabilization projects pioneered by TBNEP and the Soil and Water Conservation District (SWCD) and calls on the agricultural community to enhance river banks to healthy riparian condition (HRC). Based on the success of TBNEP prototype fish-friendly tide gates, the plan outlines a strategy to upgrade 25 tide gates in lowland sloughs. It also calls for the enhancement of 750 acres of tidal marsh through purchase, donation, or easements on marginal agricultural lands.

To improve rearing habitat for juvenile fish and to reduce flood impacts, the CCMP supports hydromodification to reconnect rivers and sloughs. With

about 85% of lowland wetlands lost to diking and draining, scientists and citizens stress the importance of hydrologic connectivity and recommend projects to open up blocked sloughs and to reconnect floodplain wetlands to river channels. Projects of this magnitude will require additional analysis and planning.

To address the need for additional analysis and planning, the CCMP calls on the U.S. Army Corps of Engineers (COE) and the local sponsor to develop a hydrodynamic computer model to describe and predict changes in river flow. A completed analysis will guide multiple agencies in a coordinated effort to increase habitat and mitigate environmental and economic flood damages.

While this CCMP focuses on the threatened Oregon Coast coho salmon and other salmonids, the general emphasis on ecosystem health should benefit other species, including those listed as threatened or endangered under the Endangered Species Act.

Water Quality (Chapter 5)

Today, the Bay receives high bacterial loads and other pollutants from diverse sources including livestock operations, wastewater treatment plants, on-site sewage disposal systems (OSDS) and urban runoff. Many stream reaches also fail to meet water quality criteria for temperature, and exceed recommended concentrations of suspended solids. Significant oxygen depression and excessive nutrient concentrations have been observed in some lowland sloughs.

To improve water quality and reduce agricultural contributions to bacterial contamination, Oregon Senate Bill 1010 requires the development of agricultural water quality management plans (SB 1010 plans). The North Coast Basin SB 1010 Plan will encompass Tillamook Bay. To meet the landowner-supported pollution prevention and control measures (PCMs) required in the SB 1010 plan, livestock operation managers should implement voluntary farm management plans. The CCMP water quality action plan describes the improved farm practices necessary, and commits to helping local farmers implement voluntary farm management plans. Moreover, it calls for annual Confined Animal Feeding Operation (CAFO) inspections by 2004, with all agricultural operations (not just CAFOs) in compliance with the SB 1010 plan by 2010. To strengthen these efforts, the CCMP identifies agency partners, educational programs, and likely funding sources to improve agricultural practices in Tillamook County.

Recently-completed storm sampling of Tillamook Bay and the Trask and Tillamook Rivers found that 16-73% of the bacteria was of human origin, with

the human-origin bacteria proportion tending to rise as the storm wore on. See Table 5-2, reporting findings of Bower and Moore, 1999. Based on these findings, the CCMP targets human activities and outlines action plans to upgrade wastewater treatment plants, expand sewer networks, and ensure that on-site disposal systems work properly. Wastewater treatment plants will eliminate all discharge failures by 2002, and the city of Tillamook will expand its sewer network by 2005. In the estuary, ODA will update shellfish management plans based on new information about bacterial sources, levels, and distribution.

Reducing bacteria inputs, enhancing Key Habitat, and addressing Erosion and Sedimentation problems will also reduce other water quality problems, such as excessive nutrients and low dissolved oxygen. However, specific Water Quality actions address temperature and suspended sediments.

Erosion and Sedimentation (Chapter 6)

Excessive sedimentation can simplify or degrade habitats and modify river flows and flood patterns. Sediment loading, movement, and deposition all affect instream and estuarine habitat and Bay bathymetry. The CCMP targets forest roads, an important source of human-caused sediment loading, and outlines a strategy to identify, prioritize, and upgrade forest roads. Under the leadership of Department of Forestry (ODF), the CCMP commits to upgrade 1,400 miles of forest roads with better culverts and drainage ditches. The plan also calls on state and private foresters to decommission at least 50 miles of unneeded forest management roads by 2010.

To improve sediment and habitat conditions associated with timber harvesting, the CCMP encourages state and private forest owners to go beyond the Forest Practices Rules in protecting riparian and high-risk areas. The plan recognizes the voluntary efforts of the Oregon Forest Industries Council (OFIC) and private foresters to improve riparian and instream habitats.

In the lower Watershed, the CCMP targets urban runoff and calls on Tillamook County and the cities of Tillamook, Bay City, and Garibaldi to adopt new ordinances to control erosion due to construction. Other lower Watershed sources of sediment, including streambank erosion and runoff from agricultural lands, are addressed through actions in the Key Habitat and Water Quality chapters. These actions will reduce sediment loading to help meet habitat requirements for salmonids and other aquatic species and achieve state water quality standards by 2010.

Flooding (Chapter 7)

Large floods continue to damage human property, modify hydrology, and impact aquatic habitats. The CCMP endorses the Tillamook County Flood Hazard Mitigation Plan (FHMP) and its approach to comprehensive floodplain management. It supports better land use planning, structural and non-structural floodwater control, and innovative ways to enhance floodplain function and restore habitats. Based on a careful hydrological and hydraulic analysis, Tillamook County will implement future projects to improve drainage and increase floodplain water storage capacity.

Under the Performance Partnership, Tillamook County will coordinate flood management programs of the COE, the Federal Emergency Management Agency (FEMA), and other agencies working to integrate flood control and habitat restoration. Although we support the human safety and economic actions outlined in the FHMP, the NEP's Clean Water Act basis limits this CCMP's Action Plan to environmental issues.

CCMP Implementation

Implementation and Finance (Chapter 8)

To address the need for better, faster, more efficient government services, the CCMP describes a Performance Partnership to coordinate and leverage agency resources. The NEP will continue through this new County department, which will coordinate a consortium of agencies, non-profits, and business and citizen members for greater cooperation among agencies and more innovative solutions for the citizens they serve. The CCMP also supports economic incentives to engage landowners in long-term environmental restoration and stewardship. Chapter 8 describes the Tillamook County Performance Partnership as the implementation vehicle and identifies likely sources of funding to accomplish program goals and objectives.

Citizen Involvement (Chapter 9)

To develop and reinforce strong stewardship among all citizens, the Plan supports new institutions in Chapter 9 to empower local citizens and provide them with information they need to make informed decisions about their watershed. The CCMP vision identifies the Tillamook Bay Watershed Council (TBWC) as the primary mechanism to ensure continued citizen support for implementation. The plan outlines a strategy to maintain a Tillamook Coastal Watershed Resource Center (TCWRC) that serves as a clearinghouse for geographic information and provides expertise to watershed councils.

To help citizens become effective partners in implementing the CCMP, the Citizen Involvement Action Plan sets forth new education and outreach programs for farmers, riparian owners/users, watershed council members, local judiciary, and others responsible for good land management. The Plan calls for better institutional linkages among regional universities, the local community college, and public schools. Other actions recommend better training for teachers and greater opportunities for outdoor learning.

Monitoring and Research Needs (Chapter 10)

The CCMP includes a plan to monitor the implementation and effectiveness of the Action Plan in meeting goals and objectives. The monitoring strategy in Chapter 10 describes quantitative methods to assess changes in key environmental parameters, and a format for monitoring CCMP implementation and effectiveness.

Although earlier studies provided a wealth of environmental information, scientists and stakeholders still have much to learn about how the ecosystem works and how to prioritize management actions. For these reasons, the Plan recommends additional assessment and monitoring programs and applied research in selected areas. Some important examples include:

- map and prioritize critical habitats for protection and enhancement;
- characterize interactions between oysters/eelgrass/burrowing shrimp;
- track fish population trends;
- characterize fish use of the estuary;
- identify road problems and prioritize upgrades;
- monitor water quality (bacteria, temperature, total suspended solids, etc.) hot spots and track trends;
- provide better information for farm management plans; and
- develop hydrodynamic computer models for river management.

These and other technical studies will optimize limited implementation dollars, ensure public accountability, and allow managers to evaluate progress in meeting goals and objectives. In most cases, state and federal agencies have already developed solid field methods to conduct surveys and implement monitoring programs. The Performance Partnership will develop a Web-based accountability system, housing all monitoring data at the Tillamook Coastal Watershed Resource Center, tracking progress and costs for easy Internet access. Quality-assured monitoring data will be available in GIS. Intent is for all studies and data to be Web-accessible. The Performance Partnership plans to better coordinate agency activities and to maintain robust monitoring

programs that track core monitoring objectives, detailed in Chapter 10, Monitoring and Research Needs.

Federal Consistency (Chapter 11)

Coordinating still-evolving programs has been – and will continue to be – a major concern of the Tillamook Bay National Estuary Project and the Tillamook County Performance Partnership, which will implement this CCMP. In keeping with our Clean Water Act mandate and good management principles, Chapter 11 reviews federal mandates, laws, and programs which may affect or be effected by this plan, and sets forth a mechanism for avoiding and correcting inconsistencies.

Citizens' Priority Actions

The actions in the CCMP were developed based on citizen input. Beginning with the Visioning Process in 1995 and culminating with the Roundup in July of 1997 (see Chapter 9, Citizen Involvement), a list of 24 widely-supported citizen suggested actions emerged:

Water Quality

- Devise additional strategies for the control of fecal coliform bacteria.
- Ensure adequate wastewater treatment plant capacity.
- Prevent livestock access to streams with fences and/or vegetative buffers.*
- Achieve significant dairy participation in the MEAD project.

Key Habitat

- Define critical and protected fish habitat on small watershed scale.
- Support the Oregon Plan for Salmon and Watersheds (formerly the Oregon Plan and the CSRI).
- Control burrowing shrimp.
- Identify, assess, and map sloughs.
- Expand, identify, and facilitate economic incentives and cost-sharing programs for restoration/enhancement.
- Identify, assess, and map wetland areas.
- Increase the amount and quality of salmonid habitat (7 strategies).
- Protect and expand aquatic (salmonid) habitat.
- Tide gate and lowland culvert management and modification.
- Curtail land use in critical sub-basins.
- Designate Bayocean Spit as a Recreation/Natural zone.
- Protect riparian and aquatic habitats.
- Establish a land trust or adopt the Central Coast Land Conservancy as recipient and manager of purchased lands and easements.

* Repeated action

- Encourage wetland restoration on private lands, through economic incentives and other methods.

Erosion and Sedimentation

- Resurvey the Bay bottom (bathymetry) to document changes.
- Upgrade forest roads by improving drainage structures and culverts.
- Develop and maintain better roads.
- Prevent livestock access to streams with fences and/or vegetative buffers.*

Flooding

- Set up association/control district to coordinate flood mitigation.

General

- Integrated GIS education, support, and planning.
- Establish a watershed council for Tillamook Bay.

High Priority Goals and Actions

Directed to fully develop an action plan for each of the priority problems, subcommittees composed of management conference members and interested stakeholders used the citizen recommendations as a starting point. Although the action titles have changed, the intent of those 25 recommendations is woven throughout the current action plan. Some good ideas are not included in this plan due to the requirements and constraints of the legislation that funds the NEP, but are found elsewhere (*e.g.*, economic development and the socio-economic effects of flooding are addressed in the Performance Partnership Goals and the Tillamook County Flood Hazard Mitigation Plan).

This list of priority goals and actions was developed using a three-pronged approach:

1. Management Committee Members completed a survey ranking each action (as published in the September 1997 Draft CCMP) as to its environmental benefit and its cost-benefit ratio (*i.e.*, “bang-for-the buck”). The top priority actions from the Management Committee Prioritization Exercise are on Page 1-16. Management Committee members’ agency plans and comments on each action detailed in Appendices B and C. The highest scoring actions were then grouped according to six major strategies or goals which closely reflect the goals identified by the Tillamook County Performance Partnership.
2. To confirm public support for the priority actions, we revisited the priority goals and actions identified in the Visioning Process, the Roundup (Page 1-14), and the results of the 1995 TBNEP Public Questionnaire and the Tillamook County Futures Council Household Survey of March 1998.

3. We went out for final public comment in spring 1999, soliciting comments on the final draft. After placing newspaper news releases and radio announcements, and mailing 1,000 postcards to the TBNEP mailing list, the CCMP was made available on the TBNEP and Tillamook Coastal Watershed Resource Center web pages, and hard copies were placed in key locations. Comments have been accounted for in this document.

The ideas of the actions in the CCMP Priority Goals and Actions List appear repeatedly as priorities in each review process, indicating solid community support.

Just because a goal or action doesn't appear on the priority list doesn't mean that it isn't important, or that it won't get implemented — *it will! We intend to eventually implement each and every action and meet every goal.*

Management Committee Priority Actions*

Actions		Environmental Benefit Average Score	Cost Benefit Average Score
WAQ-01	Implement agricultural pollution prevention and control measures	2.75	2.63
HAB-09	Limit livestock access to streams	2.75	2.38
SED-08	Restrict harvest practices & activities in areas at high risk of landslide	2.75	2.38
HAB-06	Protect & enhance floodplain/lowland riparian vegetation	2.75	2.22
HAB-21	Protect and enhance tidal wetlands	2.71	2.38
HAB-15	Adopt local ordinance to protect riparian areas	2.63	2.50
SED-02	Develop forest road maintenance and improvement plans	2.63	2.38
SED-06	Ensure sufficient resources to enforce Forest Practices Act	2.63	2.38
SED-01	Identify road problems & prioritize upgrades	2.63	2.25
HAB-16	Adopt local ordinance(s) to protect instream habitat	2.57	2.50
HAB-27	Prevent introduction & control exotic species	2.57	2.38
HAB-08	Protect & enhance freshwater wetland habitat	2.57	2.25
HAB-25	Reconnect sloughs & rivers to improve water flow	2.57	2.00
HAB-31	Support the Oregon Plan for Salmon & Watersheds	2.56	2.20
HAB-05	Protect & enhance upland riparian areas	2.56	2.10

* Management Committee members rated the September 1998 Draft CCMP actions for this exercise, providing environmental and cost-benefit scores as well as information about their agencies' activities and plans. Since some action numbers and titles have changed since then, they may not correspond exactly with those in this draft. They rated each action's environmental benefit/importance and cost-effectiveness "High", "Medium," or "Low" and these ratings were assigned values of 3, 2, or 1 and averaged. Other information from the exercise is summarized in Appendices B and C.

High-Priority CCMP Goals and Related Actions

Goal: Implement Pollution Control Measures

- WAQ-01: Define, Implement, and Enforce Pollution Prevention and Control Measures on Agricultural Lands
- WAQ-02: Implement Voluntary Farm Management Plans
- WAQ-03: Implement Revised CAFO Inspection Procedure
- WAQ-04: Use Farm-Specific Agronomic Rates for Nutrient Management
- WAQ-05: Provide Farm Management Training Programs
- WAQ-09: Ensure Properly Functioning On-Site Sewage Disposal Systems
- WAQ-10: Implement Temperature Management Strategies

Goal: Improve Roads

- SED-01: Implement Road Erosion and Risk Reduction Projects
- SED-04: Ensure Sufficient Resources to Enforce Forest Practices Act

Goal: Enhance Riparian Areas

- HAB-05: Protect and Enhance Upland Riparian Areas
- HAB-06: Protect and Enhance Lowland/Floodplain Riparian Areas
- HAB-09: Control Livestock Access to Streams
- HAB-10: Stabilize Streambanks Using Alternatives to Riprap
- HAB-11: Encourage Protection and Enhancement on Private Lands
- HAB-13: Increase Incentive Program Payments

Goal: Enhance Instream Conditions

- HAB-07: Protect and Enhance Instream Habitat
- HAB-09: Control Livestock Access to Streams
- HAB-14: Ensure Minimum Streamflows
- HAB-15: Revise Local Ordinances to Increase Protection of Riparian Areas, Wetlands, and Instream Habitat
- WAQ-10: Implement Temperature Management Strategies
- WAQ-11: Implement Suspended Sediments Management Strategies
- SED-02: Implement Practices That Will Improve Sediment Storage and Routing

Goal: Enhance Estuary and Tidal Habitat

- HAB-11: Encourage Protection and Enhancement on Private Lands
- HAB-13: Increase Incentive Program Payments
- HAB-15: Revise Local Ordinances to Increase Protection of Riparian Areas, Wetlands, and Instream Habitat
- HAB-17: Characterize Estuarine and Tidal Habitats
- HAB-18: Prioritize Tidal Sites for Protection and Enhancement

HAB-20: Protect and Enhance Eelgrass Habitats

Goal: Improve Floodplain Condition

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

FLD-02: Implement Watershed Drainage Modification Projects

FLD-04: Update Existing Floodplain Map

FLD-05: Restrict New Construction and Development in the Floodplain

HAB-19: Protect and Enhance Tidal Marsh

HAB-21: Remove or Modify Ineffective Tide Gates and Floodplain/Lowland Culverts

CCMP Goals and Objectives: Key Habitat

Goal Assess, Protect, and Enhance Riparian Habitat

Objectives Enhance 200 miles of forested riparian habitat to healthy riparian condition by 2010.

Enhance 500 miles of riparian habitat in the 0–500' elevation band to healthy riparian condition by 2010.

Goal Assess, Protect, and Enhance Instream Habitat

Objectives Enhance 100 miles of upland instream habitat by 2010.

Upgrade 50% of all tide gates by 2010.

Goal Assess, Protect, and Enhance Wetland Habitat

Objectives Enhance 100 acres of freshwater wetland by 2010.

Enhance 750 acres of tidal wetland by 2010.

Goal Assess, Protect, and Enhance Estuary and Tidal Habitats

Objectives Enhance 750 acres of tidal wetland by 2010.

No net decline in eelgrass beds.

Goal Enhance Health of Salmonids, Shellfish, and Other Aquatic Species

Objective Achieve Oregon Department of Fish and Wildlife (ODFW) wild fish production and escapement goals (See chart on Page 4-2) by 2010.

Goals, Objectives, and Monitoring

The CCMP lays out a 10-year action plan to achieve specific targets. It builds on the NEP, and calls agencies, watershed councils, and industry groups to action under a Performance Partnership. This new partnership will implement the CCMP and commits to meeting CCMP goals by 2010.

To firm our commitments and measure our progress, the CCMP defines goals and objectives, and lays out a monitoring plan to measure our progress and adjust the plans as needed. Indicators such as bacteria loads, riparian condition, and eelgrass beds will be monitored. The TBNEP Management Committee agreed on these objectives, which define accountability for all stakeholders, based on best available science and best professional judgment. We believe these goals to be ambitious, but realistic.

The TBNEP offers these goals and objectives as challenges to the agencies, citizens, industries, and other stakeholders who commit to meeting them under the Tillamook County Performance Partnership.

CCMP Goals and Objectives: Water Quality

Goal **Promote Beneficial Uses of the Bay and Rivers**

Objectives Achieve water quality standards for bacteria in the rivers and Bay by 2010.

Document at least a 25% reduction in bacteria loads to rivers, with apparent trends by 2005 and statistically significant results by 2010.

Achieve at least a 25% reduction every four years in the number of days that the rivers are not in compliance with water quality standards for bacteria.

Goal **Reduce Instream Temperatures to Meet Salmonid Requirements**

Objectives Achieve in-stream temperatures that meet salmonid requirements by 2010.

Goal **Reduce Instream Suspended Sediments to Meet Salmonid Requirements**

Objectives Achieve in-stream suspended sediment concentrations that meet salmonid requirements by 2010.

Document at least a 25% reduction in sediment loads to rivers, with apparent trends by 2005 and statistically significant results by 2010.

Goal **Improve Farm Management Practices**

Objectives Achieve Senate Bill 1010 compliance among 100% of livestock operations by 2010.

Inspect every CAFO annually by 2004.

Goal Assess and Upgrade Wastewater Treatment Infrastructure

Objective End wastewater treatment plant failures by 2002.

Goal Assess and Upgrade Urban Runoff Treatment Infrastructure

Objective Control runoff from all construction and development in urban areas by 2003 (Erosion and Sedimentation objective).

CCMP Goals and Objectives: Erosion and Sedimentation

Goal Reduce Sediment Risks from Forest Management Roads

Objectives Upgrade 1,400 miles of forest roads on state and private lands by 2010.
Decommission 50 miles of forest management road by 2010.
Conduct regular road maintenance on all 2,000 miles of forest management roads.

Goal Reduce the Adverse Impacts of Rapidly Moving Landslides

Objectives Upgrade 1,400 miles of forest roads on state and private lands by 2010.
Decommission 50 miles of forest management road by 2010.
Conduct regular road maintenance on all 2,000 miles of forest management roads.

Goal Improve Channel Features to Improve Sediment Storage and Routing

Objectives Habitat Riparian and Water Quality suspended sediments objectives below

Goal Reduce Adverse Impacts of Erosion and Sedimentation from Developed and Developing Areas

Objective Control runoff from all construction and development in urban areas by 2003.

Goal Reduce Adverse Impacts of Erosion and Sedimentation from Agricultural Areas

Objectives Lowland, freshwater wetland, and tidal marsh habitat objectives below

Related CCMP objectives Enhance 200 miles of forested riparian habitat to healthy riparian condition by 2010. (Habitat Objective)
Enhance 500 miles of riparian habitat in the 0–500’ elevation band to healthy riparian condition by 2010. (Habitat Objective)
Enhance 100 miles of upland instream habitat by 2010. (Habitat Objective)

Enhance 750 acres of tidal wetland by 2010. (Habitat Objective)

Achieve instream suspended sediment concentrations that meet salmonid requirements by 2010. (Water Quality Objective)

Document at least a 25% reduction in total suspended solids loads to rivers, with apparent trends by 2005 and statistically significant results by 2010. (Water Quality Objective)

CCMP Goals and Objectives: Flooding

Goal	Improve Floodplain Condition
Objective	<p>Complete 20 projects within the two years following adoption of hydrodynamic model which:</p> <ul style="list-style-type: none"> • measurably reduce runoff rate in the Watershed's uplands (increasing interflow and ground water recharge, thereby reducing stream temperatures and increasing summer flows); • improve drainage characteristics in the Watershed's lowlands (<i>e.g.</i>, connect sloughs and rivers to fresh water exchange in sloughs); • increase floodplain storage capacity in the Watershed's lowlands (<i>e.g.</i>, set back levees to increase floodwater capacity, increase riparian area, and create opportunity for sediment deposition); and • improve the natural environment's capacity to withstand and benefit from flood events.
Goal	Develop and Maintain a Comprehensive Floodplain Management Plan
Objective	<p>Implement a GIS-based, unsteady state hydrodynamic model by year 2001.</p> <p>Raise at least 60 houses at least 3 feet above the 100-year flood elevation by year 2001, and other houses as resources permit.</p> <p>Construct 10 livestock and equipment pads in flood-prone areas by 2001 to reduce pollution from petrochemicals and animal wastes during major floods.</p> <p>Secure and/or remove known hazardous chemicals from areas where they pose a real threat to water quality during flood events by 2005.</p>

Citizen Involvement goals include:

Goal	Improve Community Education
Goal	Strengthen KB12 Science and Outdoor Programs
Goal	Promote Community Development

Key Habitat Action Plan

Riparian, Instream, and Wetland Habitat

- HAB - 01 Characterize Riparian and Instream Habitat
- HAB - 02 Assess and Map Riparian and Wetland Habitat
- HAB - 03 Prioritize Upland Protection and Enhancement Sites
- HAB - 04 Prioritize Floodplain/Lowland Protection and Enhancement Sites
- HAB - 05 Protect and Enhance Upland Riparian Areas
- HAB - 06 Protect and Enhance Lowland Riparian Areas
- HAB - 07 Protect and Enhance Instream Habitat
- HAB - 08 Protect and Enhance Freshwater Wetland Habitat
- HAB - 09 Control Livestock Access to Streams
- HAB - 10 Stabilize Streambanks Using Alternatives to Riprap
- HAB - 11 Encourage Protection and Enhancement on Private Lands
- HAB - 12 Sponsor a Native Vegetation Planting Day
- HAB - 13 Increase Incentive Program Payments
- HAB - 14 Ensure Minimum Streamflows
- HAB - 15 Revise Local Ordinances to Increase Protection of Riparian Areas, Wetlands, and Instream Habitat
- HAB - 16 Effectively Enforce Laws and Regulations

Estuary, Sloughs, and Tidal Marsh

- HAB - 17 Characterize Estuarine and Tidal Habitats
- HAB - 18 Prioritize Tidal Sites for Protection and Enhancement
- HAB - 19 Protect and Enhance Tidal Marsh
- HAB - 20 Protect and Enhance Eelgrass Habitats
- HAB - 21 Remove or Modify Ineffective Tide Gates and Floodplain/Lowland Culverts
- HAB - 22 Enhance Large Wood in Estuary
- HAB - 23 Update the Estuary Plan and Zoning
- HAB - 24 Reconnect Sloughs and Rivers to Improve Water Flow
- HAB - 25 Control Burrowing Shrimp Populations
- HAB - 26 Prevent Introduction and Control Exotic Species

Fishery Practices

- HAB - 27 Effectively Enforce Fishing Regulations
- HAB - 28 Evaluate Commercial and Sport-Fishing Practices
- HAB - 29 Implement Essential Fish Habitat Mandates
- HAB - 30 Support the Oregon Plan for Salmon and Watersheds

Water Quality Action Plan

- WAQ-01 Define, Implement, and Enforce Pollution Prevention and Control Measures on Agricultural Lands
- WAQ-02 Implement Voluntary Farm Management Plans
- WAQ-03 Implement Revised Confined Animal Feeding Operation (CAFO) Inspection Procedure
- WAQ-04 Use Farm-Specific Agronomic Rates for Nutrient Management
- WAQ-05 Provide Farm Management Training Programs
- WAQ-06 Ensure Adequate Wastewater Treatment Capacity
- WAQ-07 Expand Sewer Network
- WAQ-08 Ensure Adequate Urban Runoff Treatment and Retention
- WAQ-09 Ensure Properly Functioning On-Site Sewage Disposal Systems
- WAQ-10 Implement Temperature Management Strategies
- WAQ-11 Implement Suspended Sediments Management Strategies
- WAQ-12 Evaluate Shellfish Growing Area Classifications
- WAQ-13 Update Shellfish Management Plan Closure Criteria

Erosion and Sedimentation Action Plan

Roads, Landslides, and Forest Practices

- 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
- SED-04 Ensure Sufficient Resources to Enforce Forest Practices Act
- SED-05 Reduce Sedimentation from Non-Forest Management Roads
- SED-06 Develop, Implement, and Enforce a Stormwater Management Ordinance

Flooding Action Plan

- FLD-01 Develop a GIS-Based, Unsteady State Hydrodynamic Model
- FLD-02 Implement Watershed Drainage Modification Projects
- FLD-03 Elevate and/or Relocate Structures, Livestock and Equipment
- FLD-04 Update Existing Floodplain Map
- FLD-05 Regulate New Construction and Development in the Floodplain
- FLD-06 Effectively Clear Mapped Lowland Floodways or Floodplains of Hazardous Materials

Citizen Involvement Action Plan

- CIT - 01 Implement an Oregon State University Extension Watershed Masters Series
- CIT - 02 Implement an Associate of Arts Oregon Transfer Degree in Environmental Studies
- CIT - 03 Improve Professional Development for K–12 Teachers
- CIT - 04 Strengthen Organizational and Institutional Linkages
- CIT - 05 Expand Authentic Learning Experience Opportunities
- CIT - 06 Establish a Land Trust or Conservation Organization
- CIT - 07 Sustain the Tillamook Bay Watershed Council
- CIT - 08 Sustain the Tillamook Coastal Watershed Resource Center