APPENDIX D

NESTUCCA BAY WATERSHED TMDL WATER QUALITY MANAGEMENT PLAN

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INTRODUCTION

Clean Water Act, 303(d) List, TMDLs, and Implementation Strategy

Section 303(d) of the 1972 federal Clean Water Act (CWA) as amended requires states to develop a list of rivers, streams and lakes that cannot meet water quality standards without application of additional pollution controls beyond the existing requirements on industrial sources and sewage treatment plants. Waters that need this additional help are referred to as "water quality limited". Water Quality Limited waterbodies must be identified by the Environmental Protection Agency (EPA) or by a state agency which has been delegated this responsibility by the EPA. In Oregon, this responsibility rests with the Oregon Department of Environmental Quality (DEQ). The DEQ updates the list of water quality limited waters every two years. The list is referred to as the 303(d) list. Section 303 of the CWA further requires that Total Maximum Daily Loads (TMDLs) be developed for all waters on the 303(d) list. A TMDL defines the amount of a pollutant that can be present in the waterbody without causing water quality standards to be violated. The total amount of allowable pollutants is then allocated among the background sources, point sources, nonpoint sources and the amount needed as a measure of safety. The point sources are given wasteload allocations (WLAs) and the nonpoint sources as well as background are given load allocations (LAs).

Along with a TMDL, a water quality management plan (WQMP) is developed that describes a strategy to meet the allocations detailed in the TMDL. This strategy must include actions that will result in reductions in contributions from nonpoint sources to the level of the load allocations (LAs) and for reducing discharges from point sources to the level of the waste load allocations (WLAs) prescribed in the TMDL. The WQMP/Implementation Plan must include specific information to meet both State of Oregon statutes/rules and federal requirements.

TMDL Implementation Strategy Guidance

DEQ has entered into an agreement with the EPA regarding implementation of Section 303(d) of the Federal Clean Water Act. Terms of that agreement include submission of water quality management plans along with The elements of these WQMPs are:

1. Condition Assessment
2. Goals and Objectives
3. Management Measures
4. Timeline for Implementation
5. Identification of Responsible Participants
6. Reasonable Assurance of Implementation
7. Monitoring and Evaluation
8. Public Involvement
9. Maintenance of Efforts over time
10. Costs and Funding
11. Legal Authorities to be Used
12. Estimate of the Time It Will Take to Meet Water Quality Standards
13. Milestones for Measuring Progress
14. Plans for Revising the TMDL if Progress is Not Being made

ELEMENT 1: CONDITION ASSESSMENT AND PROBLEM DESCRIPTION

Geographic Region of Interest

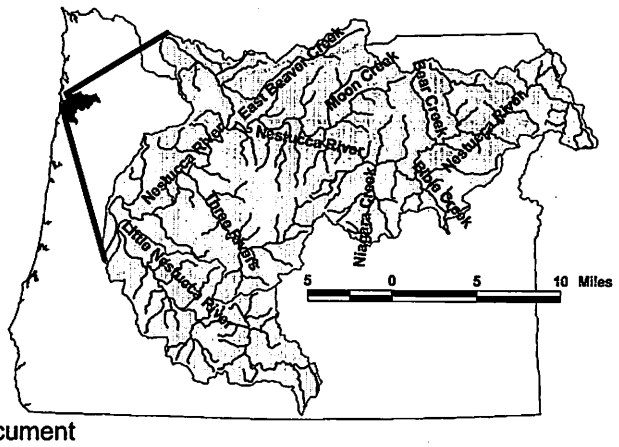


Figure 1. Location of Nestucca Bay Watershed.

The Nestucca and Little Nestucca River watersheds are located in northwest Oregon occupying approximately 371 square miles. The hydrologic unit (HUC) containing the Nestucca and Little Nestucca, classified accordingly as a 'sub-basin' or 4th field watershed, is 17100203 (USGS, 1989). It is important to note that additional watersheds are located within this HUC (i.e., Miami, Kilchis, Trask, Wilson, and Tillamook Rivers). These systems are located within the Tillamook Bay Watershed. This document only covers information pertaining to the rivers draining into the Nestucca Bay.

The Nestucca Bay Watershed (**Figure 1**) is part of a coastal , temperate rainforest ecosystem west of Portland on the western slope of the Coast Range of Oregon. A typical year brings almost 80 inches (203 cm) of rainfall in the lower basin and up to 180 inches (460 cm) at higher elevations. The mean annual temperature is 50.4 °F (10.2 °C), with yearly mean maximum and mean minimum temperatures of 60 ° F (15.55 °C) and 43 °F (6.1 °C), respectively (NNWC, 1998). The soils are loamy, well drained, with moderate permeability. Sand dunes, beach sands, and alluvial deposits make up the youngest geologic materials in the lower river basin. Alluvial deposits, consisting of gravel, sand, and silt, are most extensive along the Nestucca River and its major tributaries. Along Nestucca Bay, the deposits consist mainly of mud, silt, and sand (USFS and BLM 1994). The Nestucca and Little Nestucca Rivers flow into Nestucca Bay draining a 371 square mile (217,085 acre) watershed.

The upper watershed originates in the high, steep ridges of the Coast Range at elevations reaching 3,133 feet (approximately 1000 m). The uplands support coniferous forests of douglas fir, true fir, spruce, cedar, and hemlock, and covering approximately 82% of the total area. Hardwood species such as alder and maple also grow throughout the region, especially as second growth in riparian areas. Understory vegetation is generally composed of a dense growth of shrubs, herbs, ferns, and cryptogams.

The lower watershed is composed of rich alluvial plains used primarily for dairy agriculture, rural residential, and urban uses. The basin includes approximately 35,663 acres of lowlands in which approximately 3,945 acres support approximately 7,000 dairy cattle (USDA, 1992). Once characterized by meandering rivers and networks of small channels that provided fish habitat, woody debris, and organic matter, the lowlands have been modified by dikes, levees, channels, tide gates, and riprap.

Nestucca Bay is a small, shallow estuary covering approximately 1,000 acres (405 hectares). Tidelands, the area between mean low water (MLW) and mean high water MHW), represents approximately 578 acres (233 hectares), or 58 percent (DSL 1973). The mean tidal range at the entrance to the Nestucca Estuary is 5.8 feet, (1.77 meters), and the spring tidal range is 7.6 feet (2.32 meters), (NOAA 1977). The mean tidal range multiplied by the mean surface area between MHW and MLW produces a tidal prism of 170-million cubic feet. From values reported by Johnson (1972) and computations from the tide tables, it is apparent that the Nestucca Estuary has considerably less salt water exchange than most other Oregon estuaries (ODFW 1979). Although there are no published data on tidal dynamics, some crude estimates of mixing characteristics can be obtained by the flow ratio method discussed by Simmons (1966). The flow

ratio is the volume of fresh water which enters an estuary during a tidal cycle divided by the tidal prism. Results of the flow ratio analysis indicate that the estuary is well mixed in the spring, summer, and fall and partially mixed in winter (ODFW 1979).

The Bay receives fresh water input from two rivers and exchanges ocean water through a single channel in the Southwest corner. Tidal effects extend various distances up the rivers, ranging from 7 miles (11.26 kilometers) for the Nestucca River (USFS,BLM 1994), to 2.5 miles (11 kilometers) for the Little Nestucca River (USFS 1998). The Nestucca River discharges an average of 750,000 acre-feet of water annually. The Little Nestucca River flow is estimated to be one-forth of that figure (OSWRB 1961). Mean monthly river discharge from the Nestucca River is approximately 2000 cfs from November through March. It falls below 250 cfs during the period July – September (ODFW 1979). Only a few random estuarine water temperatures have been recorded (Giger 1972a; Giger 1972b, ODEQ 1978). The data suggests that the relative amounts of river and ocean water combined with the seasonal mixing characteristics greatly influence water temperatures. Water temperatures will be higher in shallow areas, during low tide (except in winter), and in summer (ODFW 1979).

Giger (1972b) and the ODEQ (1978) provide a few salinity measurements for the Nestucca River. Giger (1972b) observed higher salinities during high tide, near the mouth of the estuary, on the bottom, and during low stream flow. Salinities decreased upstream from the mouth, but decreased more slowly on the bottom. The limit of saline intrusion occurred between RM 4 and RM 5 in the summer and between RM 1.5 and RM 2.5 in the winter (Giger 1972b).

A number of other chemical parameters have been monitored including dissolved oxygen, pH, turbidity, orthophosphates, nitrates, and pathogens (DEQ 1978).

The estuary provides habitat for numerous fish, shellfish, crabs, birds, seals, sea lions, and sea grasses USFS 1998). Five species of anadromous salmonids use the estuary at some point in their life cycle (Wick 1970). A rich benthic community includes clam beds, ghost shrimp, and areas of eelgrass (Gaumer and Holstead 1976). Dungeness crabs and clams provide an important recreational opportunity. Marine mammals also use the bay for resting, feeding, and pupping. The basin also supports a wide variety of water contact recreation that includes swimming, wading, fishing and boating. Both water contact recreation and shellfish harvesting are compromised by bacterial contamination of water.

Current Conditions

The largest landowner in the Nestucca Bay Watershed is the United states Forest Service (36.4% of the surface area). Private lands account for 128 square miles (34.5% of the surface area) that occures throughout the watershed. The Bureau of Land management manages 19 square miles within these watersheds (5.0% of the surface area) and State Forests cover approximately 5.1% of the surface area. Other smaller land ownership designations include Oregon and California lands (10.8% of the surface area), Bankhead and Jones (8.3% of the surface area).

There are six assessment studies either completed or underway within the Nestucca Bay Basin. These are: Nestucca Estuary Inventory Project (ODFW 1978-1979); Nestucca Watershed Analysis, (USFS and BLM 1994); Watershed Plan and Environmental Assessment, (USDA-SCS 1986); Nestucca River Basin Water Quality Study (USDA 1992); Nestucca/Neskowin Watershed Assessment, (NNWC 1998); and the Draft Nestucca Bay Watershed Total Maximum Daily Load for temperature, sedimentation and bacteria (ODEQ 2001). The basin is commonly considered in three distinct zones; Upland, Lowland, and Estuarine habitats.

Figure 67. Land Use within the Nestucca Bay Watershed (USGS, 1979)

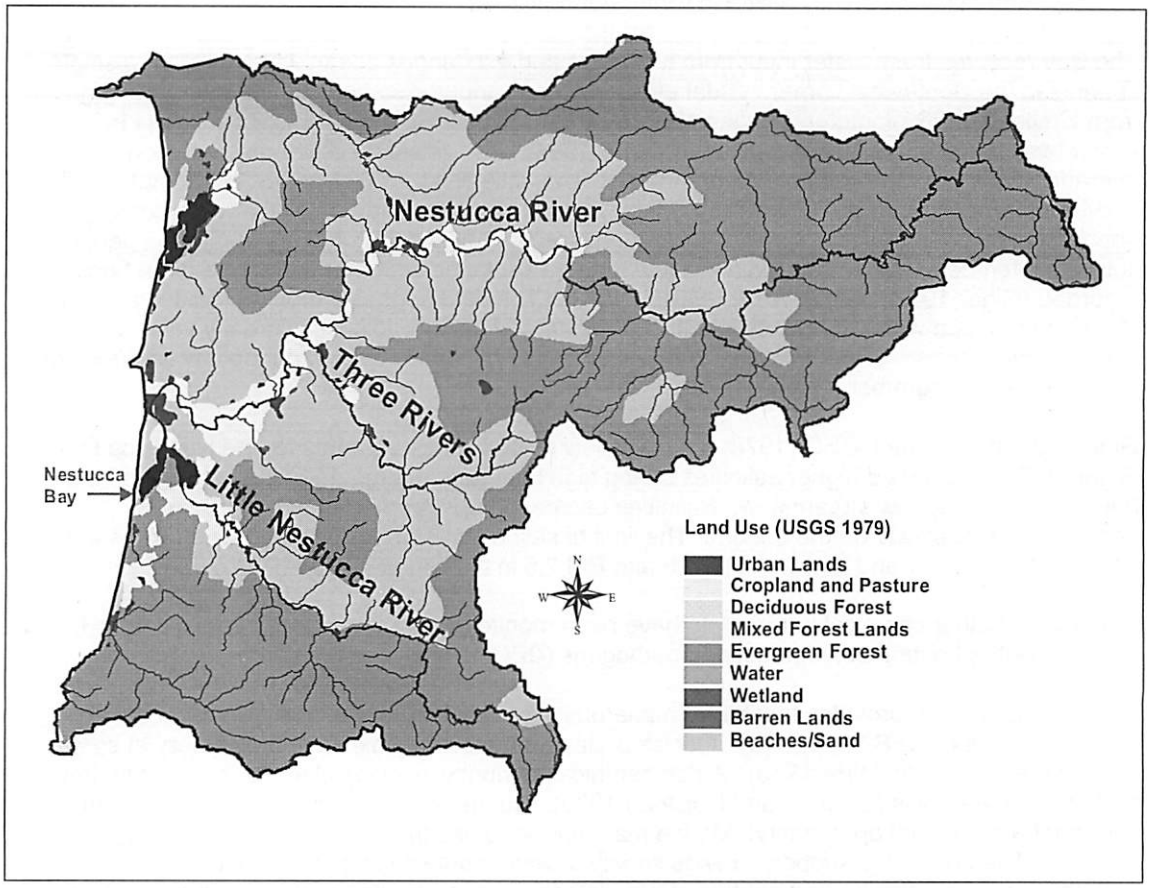


Figure 2 shows the land uses within the Nestucca and Little Nestucca watersheds identified by USGS (1979). Forested land uses predominate in the watersheds, with 93.6% of the watershed area mapped as conifer and mixed forests. Crop and pasture land uses are confined to low gradient areas near tidally influence areas and comprise 4.2% of the watershed area. Urban areas comprise less than one percent of the surface area (0.7%).

Upper Watershed Habitat

Tillamook County's forestlands have provided timber for wood products industries since the 1880s. By 1894, the timber industry was the most important industry in the County (Levesque 1985). Fires in 1845 and 1890 burned much of the Little Nestucca Watershed (USFS 1998). Repeated fires in 1910,1934, and 1939, burned additional portions of the Nestucca Watershed (USFS 1992).

The loss of forest cover and exposure of mineral soil probably resulted in increased landsliding and sedimentation to streams, as well as increased runoff and elevated stream temperatures (Baker 1986). Massive salvage logging after the Tillamook Burn left a legacy of poor quality logging roads and skid trails. Many of these legacy roads have poorly designed culverts and road crossings, blocking fish passage (Mills 1997).

Although logging in the Nestucca Watershed began in the late 1880s and increased somewhat after the aforementioned burns, significant logging did not occur until the period 1960 – 1990. Currently little logging is occuring on federal lands, however, logging on private timber lands has increased in the past decade.

Lowland/floodplain Habitat

Agriculture and urban development in the lowland floodplains altered riparian and instream habitats vital to salmon and other aquatic species. Historically, bottomland forest and open grasslands covered a rich alluvial plain that regularly flooded in winter. Off-channel sloughs, oxbows, and wetlands in these lowland floodplain's provided ample habitat for rearing fish. A forest of mixed hardwoods and conifers supplied organic matter and insects to feed fish and support the aquatic food chain. Large log-jams in the main rivers led to frequent seasonal flooding in floodplains, regularly depositing sediments to lowland areas and providing large areas of salmon habitat. Large wood deposition also created scour pools in the mainstream channels.

Early settlers cut down riparian trees to expedite log drives and cleared logjams in the main rivers to reduce flooding and improve navigation. In the early 1900s, loggers used splash dams to move logs downstream and subsequently damaged instream and riparian habitat in several river reaches. Prior to the early 1980s, ODFW policy was to clear streams and rivers of large wood to enhance fish passage. Such activities, as well as urban development, expansion of impervious surfaces, and other land changes, has caused changes in the hydrograph, sediment routing and disposition, and channel complexity.

The basin has lost most of its floodplain and lowland wetlands. Much of the landscape has been diked, ditched, filled, drained, and cleared, with poorly designed tide gates and culverts cutting off fish access to the remaining wetland habitat. Instream habitats have been channelized, straightened, riprapped, and mined for gravel. Most lowland riparian areas have been cleared of vegetation, except brush and grass. Livestock have direct access to streambanks and streams in some locations, resulting in crumbling streambanks, trampled vegetation, and disturbed streambeds. Livestock in and adjacent to streams also pollute the water with bacteria.

Estuarine Habitat

The Nestucca Estuary can be divided into a marine, a bay, and two riverine subsystems, based on sediment size, habitats, and geographic location. Although the subsystems do not function independently, a separate discussion of each is useful.

The marine subsystem is located in the lower portion of the estuary and extends from the mouth to RM 1.8 on the Nestucca River. The diurnal salinity changes and the overwash of the spit in February 1978 indicate it is an area where ocean waters have a strong influence (Komar 1978). Depths in the marine subsystem are greater then in the bay subsystem. Approximately 70% of this subsystem is intertidal habitat with primarily a sand substrate. Gaumer and Halstead (1976) reported some shrimp and a few softshell and baltic clams were found. Dungeness and other crabs species also occupy the sand habitats (Gaumer et al. 1973). Adult and juvenile anadromous fish pass through the marine subsystem. Juvenile fall chinook may rear in this subsystem before entering the sea. In some estuaries juvenile fall chinook spend the entire summer in shallow water in the lower estuary prior to seaward migration (Reimers 1970). A comprehensive inventory of fish habitats in the Nestucca and Little Nestucca River Estuaries is lacking, but research in other estuaries suggests that the cobble shore and subtidal habitats on the eastern margin of the marine subsystem may provide food and shelter for many species. Surveys also show dense accumulations of algae and eelgrass attached to the cobble substrate in the Nestucca Estuary (Gaumer and Halstead 1976).

The bay subsystem is located between the marine subsystem and the Nestucca and Little Nestucca river subsystem. It encompasses most of the major marshes and contains extensive flats where most of the fine, river-born sediments are deposited. It is a transition zone between salt and fresh waters and is shallower than either the marine or riverine subsystems. Habitats in the bay subsystem range from lower intertidal to extreme high water elevations. Eelgrass beds correspondingly graduate into algal beds, flats, low marshes, and high marshes. Intertidal marshes, flats, and aquatic beds account for approximately 83% of the surface area of the estuary (ODFW 1979). Softshell clams, baltic clams, and shrimp were observed on the flats of the bay by Gaumer and Halstead (1976). Data are scarce concerning the occurrence of other species in the bay subsystem. Perch, flounder, salmon, and cutthroat trout have been caught by anglers (Gaumer et al. 1973). Migratory waterfowl and shore birds rest and feed in large numbers in this subsystem.

The Nestucca River subsystem extends from the boat ramp at approximately RM 2.4 to the head of the tide at the Cloverdale Bridge (RM 9.0). The water is deeper and narrower in this subsystem than the bay subsystem. Available salinity data indicate that this subsystem is composed of brackish water during summer and fresh water during winter (Giger 1972b; ODEQ 1978). Downstream from the town of Woods, altered and unaltered intertidal habitats occur with low sedge marshes interspersed among riprap and pilings. Small patches of algal beds and high marsh are also found. Riverine habitats upstream of Woods are primarily subtidal. The Nestucca River subsystem is heavily used by recreational anglers (Heckeroth 1970). Cutthroat trout, winter steelhead, and fall chinook are caught as they migrate upstream. Mammals such as beaver, river otter, mink, muskrat, and meadow mouse are residents of the riparian habitats (Batterson 1971). Much of the shoreline in the Nestucca River subsystem has been altered by docks, bulkheads, pilings, and riprap.

Existing Sources of Water Pollutants

Parts of the Nestucca River, Nestucca Bay and several tributaries are currently listed as water quality limited under section 303(d) of the Clean Water Act, resulting from excessive stream temperatures, sedimentation, or elevated concentrations of bacteria. Status of a waterbody is judged based on standards set to ensure beneficial uses (**Table 1**) are protected.

Table 39. Beneficial uses occurring in the Nestucca Bay Watershed *(OAR 340 – 41 – 202)*

Beneficial Use	Occurring	Beneficial Use	Occurring
Public Domestic Water Supply	✓	Anadromous Fish Passage	✓
Private Domestic Water Supply	✓	Salmonid Fish Spawning	✓
Industrial Water Supply	✓	Salmonid Fish Rearing	✓
Irrigation	✓	Resident Fish and Aquatic Life	✓
Livestock Watering	✓	Wildlife and Hunting	✓
Boating	✓	Fishing	✓
Aesthetic Quality	✓	Water Contact Recreation	✓
Commercial Navigation & Trans.		Hydro Power	

Temperature

In the rivers, the migration, rearing and spawning of salmonid (salmon and trout) fish are put at risk by high water temperatures (those that exceed 64°F for migration and rearing, or 55°F for spawning) in the summer. In the Nestucca Bay Watershed, 41.5 miles of surface waters were

listed as water quality limited for temperature. These water bodies included Powder Creek, Niagara River, and Nestucca River downstream of Powder Creek. Sources of temperature in these streams are primarily from solar radiation that hits the surface of the water due to the widespread removal of riparian vegetation. Although there are three wastewater treatment plants in the watershed, flows from these facilities have a relatively small impact on water temperature.

Sedimentation

The upper reaches of the Nestucca River (above Powder Creek) and East Beaver Creek (a total of 34.3 miles of streams) are listed as impaired due to excessive sedimentation. Excessive sedimentation can result in streambeds that are unsuitable for spawning of salmonid fishes. There is not a numeric criterion defining excessive sedimentation, although the State of Oregon does have a narrative standard barring accumulation of deposits that would make the streambed unsuitable for support of beneficial uses. Excessive sedimentation is principally from poorly constructed or maintained forest roads, natural slides, and streambank erosion in areas where riparian vegetation has been removed. Road-building techniques and forest management practices have been improved in the last decade with the implementation of new rules under the Northwest Forest Plan (federal lands) and the Forest Practices Act (non-federal forestlands). Natural slides can be expected to continue at historical though variable rates. Streambanks in lower gradient reaches of the watershed are currently a continuing source of sedimentation. Stablization of these areas with riparian vegetation will result in decreased sedimentation, narrower channels, and better habitat for fish.

Bacteria

Shellfish harvesting in Nestucca Bay is dependent on waters with minimal concentrations of fecal bacteria. Fecal coliform bacteria in concentrations exceeding a log mean of 14 MPN/100 ml ("most probable number per 100 ml of sample") or when more than 10% of samples have concentrations exceeding 43 MPN/100 ml) cause excessive risk for consumption of shellfish by humans. Bacteria in the rivers are the primary source of the impairment of Bay waters, which support recreational shellfish harvesting. These elevated bacterial concentrations also indicate that recreational contact is not supported at all times in the rivers. The principal sources of fecal bacteria in the watershed are runoff from livestock operations, urban runoff, rural residential runoff, an undetermined number of failing septic systems in the watershed, and wastewater treatment plant discharges. Due to the relative area under livestock management, this use has a larger impact on water quality. Wildlife in the watershed probably provide a relatively low contribution to fecal bacterial loads except in areas surrounding the Bay itself, where concentrations of waterfowl may have a significant effect.

Water Quality Standard Identification

Water quality standards are currently not being met for three parameters; temperature, sedimentation, and fecal bacteria. These standards and criteria are described below. Listed reaches are presented in **Table 2.**

Temperature

A seven-day moving average of daily maximums (7-day statistic) was adopted as the statistical measure of the stream temperature standard. Absolute numeric criteria are deemed action levels and indicators of water quality standard compliance. Unless specifically allowed under a DEQ-approved surface water temperature management plan as required under Oregon Administrative Rules (OAR) 340-041-0026(3)(a)(D), no measurable surface water temperature increase resulting from anthropogenic activities is allowed in State of Oregon Waters determined out of compliance with the temperature standard. A much more extensive analysis of water temperature related to aquatic life and supporting documentation for the water temperature standard can be found in the 1992-1994 Water Quality Standards Review Final Issue Paper (ODEQ, 1995). The standard itself is in the OAR 340-041-202(2)(b)(A).

Sedimentation

The Environmental Protection Agency (EPA) and the State of Oregon do not have numeric water quality standards for streambed fines. Excessive fine sediment is addressed through application of state narrative criteria which restricts "the formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other..." beneficial uses. For listing purposes, a target of 20% streambed fines was used as an indicator of fine sediment impairment to salmonids (the most sensitive "resident biological community"). This target is based on documentation that formed the basis for interim guidance (PACFISH) for managing federal lands, ODFW habitat benchmarks (Foster, etal 2001), and other studies of sediments in salmonid habitats. Final PACFISH documentation (USFS/BLM 1995) did not include riparian management objectives based on area fines because it was inappropriate to set standards that would be applied over a large region (much of 4 western states) that included variable geology and a wide range of environments (Mike Lohrey, personal communication).

The ODFW benchmarks are specific to streams based on gradient and differing parent sediment sources. Oregon Department of Fish and Wildlife habitat benchmarks indicate a range of substrate fines thresholds above which conditions were "undesirable." The midpoint of these limits was 20% area fines for streams with sedimentary parent materials, as are found in the streambanks of the lower elevation portions of the watershed., though desirable conditions ranged from 8% to 12% fines depending on slope and parent material. This indicator is specific to riffle and glide reaches where currents continually move fine sediments through and salmonids preferentially spawn. Other features (e.g., pools) may be storage areas for fine sediments between large flushing events.

A variety of other sources support the target as appropriate for use as an allocation. A composite of studies of fry emergence related to fine sediments in substrates demonstrated substantial declines in emergence at proportions greater than 20% fines by surface area (Phillips, etal 1975; Hausle and Cobel 1976; and McCuddin 1977; all in Bjornn and Reiser 1991). Results of some studies (Bjornn and Reiser 1991) indicated embryo sensitivity to fines varied among species, but several salmonids (cutthroat and rainbow trout, kokanee, and chinook salmon) showed sensitivity beginning at approximately 20% fines.

Management plans for the Snake River basin have also indicated 20% fines as a threshold for protecting salmoinid habitat (Rhodes, 1995). Anderson, etal (1992 in Rhodes, 1995) recommend maintaining "surface fines and fines by depth in channel substrate at less than 20% in salmon spawning habitat. Where conditions are lower than standards, maintain them." Rhodes, etal (1994 in Rhodes, 1995) recommend "average surface fine sediment <20% in spawning areas with no increase allowed when surface fine sediment is <20%."

For these reasons, the Department has decided, the target for the TMDL should be based on percent fine sediment as indicated above. The loading capacity for sedimentation will be defined as:

- **20 percent streambed area fines in riffle and glide reaches.**

Long-term monitoring and the adaptive management nature of this TMDL will be used to evaluate this goal over time.

> *Sedimentation* [OAR 340-41-205(2)(j)] - "The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry shall not be allowed."
>
> *Biological criteria* (OAR 340-41-027) - "Waters of the State shall be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities."

Bacteria

The water quality standard for shellfish harvest is a 30-day log mean of 14 fecal coliform organisms per 100 milliliters (mL) with no more than 10 percent of samples exceeding 43 fecal coliform per 100 mL. These criteria have been exceeded in Nestucca Bay. The standard to protect for water contact recreation is a 30-day log-mean of 126 *E. coli* organisms per 100 mL with no single sample exceeding 406 *E. coli* organisms per 100 mL. These criteria are usually met in the watershed, but meeting the criteria for shellfish harvesting will ensure compliance with this recreational contact standard.

Table 40. Water bodies in the Nestucca Bay Watershed listed as water quality limited under section 303(d) of Clean Water Act (DEQ 1998).

Waterbody Name	Boundaries	Parameter	Criteria	Season
Niagara Creek	Mouth to Headwaters	Temperature	Rearing 64 F (17.8 C)	Summer
Powder Creek	Mouth to Headwaters	Temperature	Rearing 64 F (17.8 C)	Summer
Nestucca River	Mouth to Powder Creek	Temperature	Rearing 64 F (17.8 C)	Summer
Nestucca Bay	Bay	Bacteria (fecal coliform)	Marine and shellfish growing area	Year Around
Beaver Creek, East Fork	Mouth to Headwaters	Sedimentation	Narrative	Year Around
Nestucca River	Powder Creek to Headwaters	Sedimentation	Narrative	Year Around
Beaver Creek, East Fork	Mouth to Headwaters	Habitat Modification	Narrative	Year Around
Nestucca River	Powder Creek to Headwaters	Habitat Modification	Narrative	Year Around
Nestucca River	Mouth to Powder Creek	Flow Modification	Narrative	Year Around

ELEMENT 2: GOALS AND OBJECTIVES

The overall goal of the TMDL Implementation plan is to achieve compliance with water quality standards for each of the 303(d) listed parameters and streams in the Nestucca Bay Watershed. The specific goal of this Water Quality Management Plan (WQMP) is to describe a strategy for reducing discharges from nonpoint sources to the level of the load allocations (LAs) and for reducing discharges from point sources to the level of the waste load allocations (WLAs) prescribed in the TMDL. This WQMP is designed to be adaptive as more information and knowledge is gained regarding the pollutants, allocations, management measures, and other related areas.

The overarching goals of this WQMP are to:

Goal 1: Promote Beneficial Uses of the Bay and Rivers;

Goal 2: Reduce Instream Temperatures to Meet Salmonid Requirements;

Goal 3: Reduce Instream Streambed Area Fine Sediment to Meet Salmonid Requirements;

Goal 4 Reduce Instream Fecal Bacteria Concentrations to Meet Shellfish Harvesting and Recreational Contact Standards.

All recovery goals and plans are strongly linked to the philosophy of maintaining those components of the ecosystem that are believed to be currently functioning, and to improving those sites that show the greatest potential for improvement in the shortest time frame. This philosophy maximizes recovery while minimizing expensive, extensive, and risky restoration treatments . The goals and actions described are directly related to the Nestucca-Neskowin Watershed Council Management and Action Plan (1999), Nestucca Estuary Inventory Project (ODFW 1978-1979), Nestucca Watershed Analysis (USFS 1994), and the Nestucca River Basin Water Quality Study (USFS 1992). Many of the identified actions are common to the Nestucca Neskowin Watershed Council Action Plan and the Coordinated Conservation and Management Plan developed by the Tillamook Bay National Estuary project. Actions that will be implemented countywide have been blended from these sources.

ELEMENT 3: MANAGEMENT MEASURES

Management measures described here are those that will result in meeting the stated goals presented in Element 2. Some measures are mandatory and required as a condition of permits (e.g., wastewater discharges) or other legal requirements (e.g., Forest Practices Act). Others are measures that groups of Stakeholders in the Nestucca Bay Watershed and Tillamook County have indicated are appropriate and feasible.

A variety of state and federal laws and rules have been identified as critical in controlling discharge of pollutants to waters of the state and of the United States. These are:

- Clean Water Act section 303(d) as administered by the EPA/DEQ sets load allocations;
- NPDES and WPCF permit programs as administered by the DEQ addresses point source discharges;
- SB 1010 as administered by the ODA addresses agriculture practices;
- Oregon Forest Protection Act as administered by the ODF addresses forest practices;
- The Northwest Forest Plan as administered by the US Forest Service and the Bureau of Land Management, and;
- Local zoning and ordinances to address urban and rural residential activities.

Point Sources

Point sources of bacteria and heat originate with a variety of land uses, but are mostly associated with treated wastewater discharges operated by municipalities or industries, and with urban stormwater runoff. There are 8 permitted facilities in the Watershed. Each of these facilities has one or more general permits covering the specific activity (**Table 3**). These include wastewater discharges, stormwater from facilities, gravel-mining operations, fish hatcheries, and seafood processing. There is some monitoring associated with these permits, which may be revised when the permits are renewed.

Table 41. Wastewater Discharge Permits in the Nestucca Bay Watershed (does not include construction permits).

Facility ID	River Mile	Common Name	City	Category	Type
104818/A	0.3	Nestucca River Trailer Court	Beaver	Domestic	WPCF
110326/A	0.1	Riverhouse Food Products (ABN)	Cloverdale	Domestic	GEN54
102774/A	0.1	Wi-Ne-Ma Christian Camp	Cloverdale	Domestic	WPCF
109796/A	5.7	Tri-Agg, Inc.	Cloverdale	Indiv.	GEN12A
17318/A	7	Cloverdale Sanitary District	Cloverdale	Domestic	NPDES
100058/B	0.75[1]	Hebo Joint Water-Sanitary Auth.	Hebo	Domestic	NPDES
64440/A	2.2	Cedar Creek Hatchery	Hebo	Agricult.	GEN03
66100/A	4	Pacific City Joint Water-Sanitary Auth.	Pacific City	Domestic	NPDES

1 = Discharges to Three Rivers, tributary to the Nestucca River

The Department will work with the County, municipal and special district agencies to develop surface water temperature management plans and to complete a storm sewer system evaluation by January 1, 2005. In addition, it will explore requiring municipalities that discharge urban runoff to rivers or the Bay to obtain permits. Although strormwater is diffuse in origin, it becomes a point source when it is conveyed and discharged to receiving streams. These permits may be for individual city and county facilities, or a regional permit may be issued if the individual governments can develop the necessary agreements on overall management strategies. General NPDES permits for stormwater require development of specific stormwater management plans. These plans must specify management practices that will be used to control the discharge of pollutants to the rivers and bay and meet the Wasteload Allocations of the TMDL.

There are three NPDES-permitted wastewater discharges in the Nestucca Bay Watershed. The Cloverdale Sanitary District Wastewater Treatment Plant discharges to the Nestucca River at RM 7.0. The Hebo Joint Water and Sanitary Authority Wastewater Treatment Plant discharges to Three Rivers at RM 0.75. Pacific City Joint Water and Sanitary Authority Wastewater Treatment Plant discharges into the Nestucca River, within the tidally influenced and salty portion of the estuary, at RM 1.5. Bacterial contamination from these discharges will continue to be controlled through the conditions of the dischargers' permits. Depending on Wasteload Allocations and the likelihood of the receiving waters meeting water quality standards once best management practices are implemented, these permits may become more stringent upon renewal.

Table 42. Individual NPDES Permits and current Permit Limits.

Facility Name	Discharge Point	Permit Limits
Hebo Joint Water and Sewer Authority STP	Three Rivers at RM 0.75 To Nestucca River at RM	Monthly geometric mean of 126 /100 ml No sample exceeding 406 /100 ml
Cloverdale Sanitary District STP	Nestucca River at RM 7	Monthly geometric mean of 126 /100 ml No sample exceeding 406 /100 ml
Pacific City Joint Water and Sewer Authority STP	Nestucca River at RM 1	Monthly geometric mean of 126 /100 ml No sample exceeding 406 /100 ml

Specific Management Measures

Additional management measures were developed by the Nestucca-Neskowin Watershed Council, county and local governments, and state and federal management agencies.

Point Source Management Measures -- Bacteria

Ensure adequate urban runoff treatment and retention

- Effectively enforce laws and regulations
- Expand sewer network
- Develop system to ensure detection and elimination of illegal discharge activities
- Ensure that runoff from construction sites is contained
- Ensure that runoff from general road maintenance is contained

Point Source Management Measures -- Temperature

- Permit compliance will be the method of ensuring point sources meet Wasteload Allocations.

Non-Point Sources

Non-Point Sources of bacterial contamination and heating (temperature) are associated with large-scale land management practices. The sources include urban, rural residential ,

agricultural, and forestry uses. Elevated levels of bacteria are found in the Bay, all of the rivers flowing into the Bay, and many tributary streams throughout the basin. Major sources include dairy and other livestock operations, onsite septic systems for rural residential homes, runoff from industrial and municipal facilities, urban runoff, and both domestic and wild animals.

Temperature is associated with changes to riparian shade and channel morphology resulting from all of these land uses as well as forestry practices.

Agriculture

Many of the improvements in water quality are expected to occur as a result of implementation of the SB1010 Agricultural Water Quality Management Area Plan (AWQMAP) for the North Coast Basin (Oregon Department of Agriculture 1999), which includes the Nestucca and Neskowin Bay Watersheds. Generally the issues associated with agriculture are diffuse, or non-point sources rather than point-sources. This plan defines conditions that agricultural practices are not allowed to cause, and includes enforceable rules to ensure progress can be made. The rules are stated in the context of "Pollution Prevention and Control Measures" that were developed by a Local Advisory Committee with a variety of interests. The plan addresses riparian and streambank conditions, livestock access to surface waters, manure and nutrient management, among other issues.

Pollution Prevention and Control Measures for Agriculture (SB1010 – AWQMAP ; ODA 1999)

BACTERIA --

- Healthy Riparian and Streambank Condition
- Livestock and Grazing Management
- Manure and Nutrient Management

TEMPERATURE

- Healthy Riparian and Streambank Condition
- Tidegates
- Livestock and Grazing Management

Though not enforceable, the AWQMAP also included suggested management measures that would control pollutants at their source. While not all practices would be appropriate for any one farm, the list provides choices that may be included in management on a farm-specific basis. These practices are listed below.

Erosion and Sediment Control
Management
• Conservation tillage
• Contour farming
• Contour strip cropping
• Delayed seed bed preparation
Vegetative
• Cover crops
• Critical area planting (including wetland and riparian zone protection)
• Filter strip/field border
• Grassed waterway
Structural
• Streambank stabilization
• Clean water diversion
• Grade stabilization structure
• Sediment basin/retention pond
• Terrace

Confined Animal Facility Management (Wastewater Runoff Management)
Management
• Agronomic application of manure, composted manure or wastewater to agricultural land
Vegetative
• Heavy use area protection (e.g., cover crops)
• Grassed Waterway
Structural
• Heavy use area protection (e.g., concrete)
• Roof runoff management (e.g., gutters & downspouts)
• Dikes
• Clean water diversion
• Terrace
• Waste storage pond/structure
• Waste treatment lagoon
• Constructed wetland

Nutrient Control
Management
• Overall nutrient management planning (e.g., nutrient budgeting)
- Soil testing
- Manure, sludge, and compost testing
- Proper timing, formulation, and application methods of nutrients for maximum crop utilization
- Plant tissue testing
Vegetative
• Cover crops
• Filter Strip/field border

Pesticides
Management
• Use of Integrated Pest Management (IPM) strategies and systems
- Biological controls, pheromones, crop rotations, cover crops, economic thresholds, etc.
- Maintain inventory of current and historical pest problems, cropping patterns, and use of pesticides for each field
- Consider the persistence, toxicity, and runoff and leaching potential of products, and current label requirements in making a selection when a choice of pesticide materials exists
• Recalibrate spray equipment each spray season
• Use of anti-backflow devices on hoses used for filling tank mixtures
Structural
• Protect against leaching and runoff potential in loading, mixing, and storage areas

Grazing
Management
• Planned grazing systems
    - deferred grazing & pasture rotation
• Pasture management
    - pasture renovation, cross-fencing, brush/weed management, prescribed burning
Structural
• Alternate water supply practices (off-stream water sources)
    - placement of water and salt supplement facilities away from streams
• Limit livestock access to waterways
    - fencing, livestock exclusion, stream crossing

Irrigation
Management
• Sprinkler calibration
• Irrigation scheduling practices
    - irrigation water management; utilization of water measuring devices and soil & crop

water use data
- evaporation monitoring

Vegetative
• Cover crops and straw mulch
• Filter strip/field border

Structural
• Irrigation water application methods
- drip or trickle irrigation, sprinkler irrigation, microjet irrigation
• Drainage water management
- ditch and canal lining, subsurface drainage
• Surface and subsurface irrigation systems
- furrows, borders, contour levees/ditches
• Irrigation land leveling
• Tailwater recovery/recycling systems
• Sediment basin/retention pond
• Rip hardpans and compacted soil layers to improve infiltration rates

Irrigation and Drainage Ditches

Management
• During maintenance, remove only sand silt; avoid removing gravel important for native fish
• Conduct excavation operations with land-based equipment from one side of the channel
• Properly dispose of dredged sediments away from the channel, either on uplands or spread in a thin layer (3 inches or less) on farmed wetland or wet pasture in a manner that does not convert the wetland to upland
• Conduct maintenace and excavation only during the time period specified in the "Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources" prepared by the Oregon Department of Fish and Wildlife

Vegetative
• Promote and maintain woody vegetation along ditches and channelized streams in a manner that provides shade and shelter for fish, yet allows regular maintenace and cleaning
• Plant channel banks and work areas with grass and/or trees and shrubs after maintenance in order to minimize erosion as much as possible

Structural
• Construct and maintain ditches utilizing ditch slope and ditch cross section that are appropriate to the site and prevent ditch bank sloughing

Riparian Areas and Vegetation

Management
• Exclude livestock from riparian areas
• Create riparian pasture and manage to protect riparian vegetation and streambank stability
• Avoid manure, fertilizer, and chemical applications in the riparian area or where the riparian area could be affected
• Control noxious weeds
• Limit in-stream livestock access and crossings to the absolute minimum

Vegetative
• Riparian forest buffer
• Riparian herbaceous cover
• Vegetative buffers

Structural
• Fencing riparian areas to limit or exclude livestock access
- electric "New Zealand" style high tensile wire fences are low cost and flood resistant
• Install off-stream water sources for livestock
• Development of appropriately sized bridges and culverts for livestock crossings
• Biotechnical barbs for streambank stability

One of the key elements of this planning process is the assumption that individual Voluntary Farm Plans will be developed by a large percentage of the landowners in the basin in concert with local

agency (e.g., NRCS, SWCD personel). These farm plans would define the range of practices that individual landowners would use to ensure that their operations do not result in prohibited conditions. Through development of the plans, landowners would use their personal experience along with judgment of professionals in determining what practices will be most effective in limiting pollutant effects from their land.
In addition to Those provided by the AWQMAP for the North Coast Basin, there are other management measures that were developed through the Tillamook Bay National Estuary Project and published in the Comprehensive Conservation and Management Plan (TBNEP/TBPP 1999). Though this planning document was developed for the Tillamook Bay Watershed, many of the management measures and actions are intended to be implemented county-wide. Some of these that are relevant to temperature, sedimentation, and bacterial management are listed below.

Other Management Measures Identified for Temperature and Bacteria (CCMP – Appendix A)

- Define, Implement, and Enforce Pollution Prevention and Control Measures on Agriculture Lands.
- Implement Voluntary Farm Management Plans.
- Implement Revised Confined Animal Feeding Operation (CAFO) Inspection Procedure
- Use Farm-Specific Agronomic Rates for Nutrient Management
- Provide Farm/Livestock Management Training Programs
- Identify Stream Segments Where Heating Occurs
- Assess and Map Riparian and Wetland Habitat
- Characterize riparian and Instream Habitat
- Increase Incentive Program Payments
- Encourage Protection and Enhancement on Private Lands
- Control Livestock Access to Streams
- Prioritize Floodplain/Lowland Protection and Enhancement Sites
- Protect and Enhance Lowland Riparian Areas
- Protect and Enhance Freshwater Wetland Habitat
- Revise Local Ordinances to Increase Protection of Riparian Areas,
- Protect and Enhance Wetlands, and Instream Habitat
- Remove or Modify Ineffective Tide Gates and Culverts
- Reconnect Sloughs and Rivers to Improve Water Flow

Forestry

Forestry practices on state and private lands are governed by the State of Oregon's Forest Practices Act (FPA). The FPA defines specific measures for protecting water quality and habitat during forestry operations. These measures include leaving trees within certain distances of streambanks depending on the type of stream and occurrence of fish. These trees and understory vegetation are intended to provide a buffer between logged areas and the stream, providing shade, woody debris, filtration of sediments from overland flow, and erosion control. The FPA is the governing law on all state forest and private land.

In addition to the FPA, the Tillamook State Forest (TSF) has adopted the Western Oregon State Forest Management Plan, and is developing a Habitat Conservation Plan (HCP) for management of its forests. Both of these plans have more protective management standards than the FPA. The HCP is required by the federal government as protection of a variety of rare, threatened and endangered species that live in or on State Forest land. Although the HCP is being developed to protect habitat for endangered species, there will be direct benefits to water quality if it is implemented. Some of the principal improvements of the HCP relative to FPA regulations are:

- Increased widths of Streambank Zones from 20 to 25 feet;
- Addition of an outer Riparian Management Zone for a total of 170 feet of restricted harvest compared with 100 feet under FPA;
- No harvest in inner Riparian Management Areas where Mature Forest Condition exists;
- Increased density of trees within the Riparian Management Zones; and
- Increased Protection on non-fish-bearing streams as well as fish-bearing streams.

All of these measures will be effective in moderating temperature in forested areas where they are applied. These measures will only be required on State Forest lands, which account for relatively little (approximately 5%) area in the Nestucca Bay Watershed. Compliance by any private landowners will be on a voluntary basis.

Federal forest lands are managed by the US Forest Service (USFS) and the Bureau of Land Management (BLM). The Siuslaw National Forest manages approximately 44% of the watershed. This land area is managed under the guidelines of the Northwest Forest Plan and its Aquatic Conservation Strategy, and the Siuslaw National Forest Land and Resource Management Plan. The Standards and Guidelines for the Aquatic Conservation Strategy contain four components: riparian reserves; key watersheds; watershed analysis; and watershed restoration. Each part is expected to play an important role in improving the health of the region's aquatic ecosystems. The Siuslaw National Forest is part of the Northern Coast Range Adaptive Management Area. The management goals of the Northern Coast Range Adaptive Management Area are restoration and maintenance of late-successional forest and the conservation of fisheries habitat and biological diversity.

The Bureau of Land Management administers approximately 17% of the land in the watershed. This land area is managed under the guidelines of the Northwest Forest Plan and its Aquatic Conservation Strategy, and it is part of the Northern Coast Range Adaptive Management Area. The Standards and Guidelines for the Aquatic Conservation Strategy contain four components: riparian reserves; key watersheds; watershed analysis; and watershed restoration. Each part is expected to play an important role in improving the health of the region's aquatic ecosystems. The management goals of the Northern Coast Range Adaptive Management Area are restoration and maintenance of late-successional forests and the conservation of fisheries habitat and biological diversity. BLM lands are managed according to provisions of the Salem District Record of Decision and Resource Management Plan, as amended by the Northwest Forest Plan.

Pursuant to the *Nestucca Watershed Analysis* (1994), the most important components of the Bureau of Land Management's watershed restoration program are control and prevention of road-related run-off and sediment production, restoration of the condition of riparian vegetation, and. restoration of in-stream habitat complexity. Timelines for addressing these issues will be dependent on availability of funding.

In 2000 the Bureau completed an environmental assessment of its transportation system and issued a decision to repair storm damaged roads in ten locations and to stabilize or decommission over 80 miles of Bureau controlled roads in a five to ten year time period. The road treatments include actions such as constructing retaining walls, establishing waterbars, removing sidecast material, removing or replacing culverts, subsoiling the road surface to restore infiltration, constructing earth barricades to block roads, and revegetating disturbed areas with native or sterile species.

In January 2001 the Bureau issued a decision to enhance salmonid spawning and rearing habitat on approximately 10 miles of stream in a three to five year time period. This decision was based upon an environmental assessment conducted on the stream reaches located on lands managed by the Bureau in the upper portion of the watershed. The specific activities include the replacement and/or modification of culverts, maintenance of existing stream structures (log), and placement of new stream structures (log and boulder).

Other management actions that the Bureau intends to continue implementing within the watershed include riparian planting and site-specific silvicultural treatments (e.g., variable-spaced thinnings, snag and down wood creation) in the upland habitat to hasten the development of older forest characteristics and uneven-aged stands.

The Bureau is interested in and intends to pursue collaboration with other land owners and stakeholders in the watershed to strategize and coordinate our collective restoration efforts.

Land use Planning and County RoleOrdinances

Tillamook County is responsible for the development of local ordinances designed to control NPS water quality pollution in urban and rural residential areas. Oregon cities and counties have authority to regulate land use activities through local comprehensive plans and related development regulations. This authority begins with a broad charge given to them by the Oregon constitution and the Oregon legislature to protect the public's health, safety, and general welfare.

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

The Oregon land use planning system provides a unique opportunity for local jurisdictions to address water quality protection and enhancement. Many of the goals have a direct connection to water quality, particularly Goals 5 (Open Spaces, Scenic and Historic Areas, and Natural Resources) and 6 (Air, Water and Land Resources Quality). Tillamook County is currently conducting a periodic review of its Comprehensive Plan. Among the expected changes to this plan will be revised ordinances for the protection of riparian areas. We expect these revised ordinances to be sufficient to meet the allocations in the TMDL."
Specific ordinances identified to date are:

- Riparian protection ordinance (currently under review by Tillamook County);
- Freshwater wetlands protection ordinance;
- Intertidal wetlands protection ordinance; and
- Stormwater abatement ordinance.

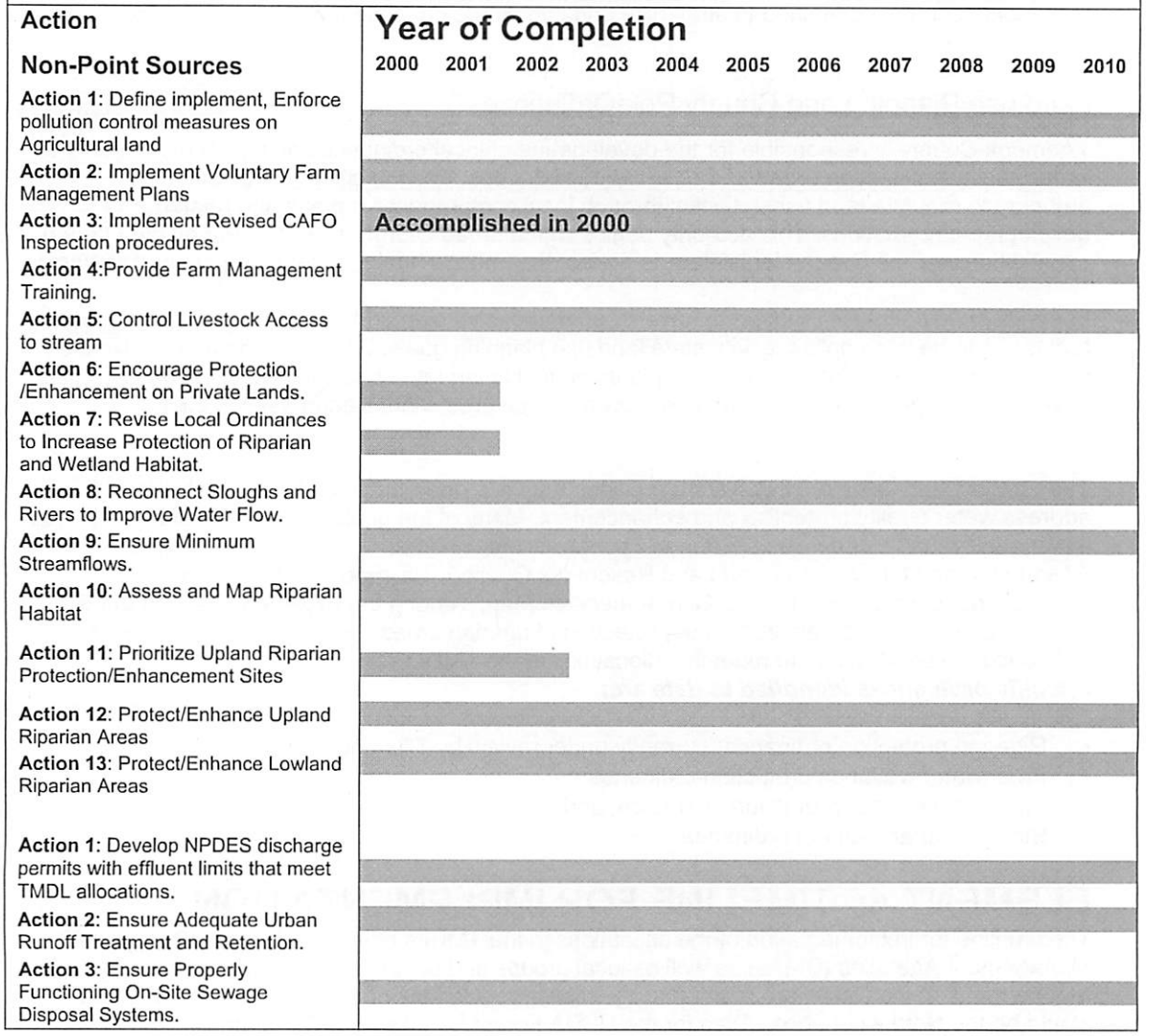
ELEMENT 4: TIMELINE FOR IMPLEMENTATION

The timeline for implementation of the allocations in the TMDLs relies on efforts by Designated Management Agencies (DMAs) as well as local groups and private citizens. Many of the requirements of the DMAs are mandated by existing regulations or plans. Examples of these would be the Northwest Forest Plan for the USDA Forest Service (USFS), or the Agricultural Water Quality Management Area Plan for the Oregon Department of Agriculture (ODA). These plans have their own timelines for compliance with management measures and achievement of goals. Tillamook County has existing ordinances that affect compliance with the allocations, but which may need to be modified to achieve compliance. The Nestucca-Neskowin Watershed Council has developed an Action Plan that addresses many of the rural non-point sources of temperature, sediment and bacteria. Many of these actions will require the watershed council to secure funding from outside sources (e.g., Oregon Watershed Enhancement Board, DEQ 319 funding).

The table below lists the actions from a variety of sources to be completed and the approximate completion date. Many actions are ongoing. They do not have completion dates but will continue to be implemented throughout the life of the plan. Some actions were developed as part of the

Coordinated Conservation and Management Plan for the Tillamook Bay National Estuary Project, but are expected to be implemented countywide. County ordinances that are being reviewed to meet needs of the CCMP would also be implemented in the Nestucca Bay Watershed.

Table 43. Actions generally identified by various planning documents. Timelines are based on TBNEP Comprehensive Conservation and Management Plan (TBNEP 1999)



ELEMENT 5: IDENTIFICATION OF RESPONSIBLE PARTICIPANTS

This element identifies the agencies and organizations responsible for the implementation strategy and to list the major responsibilities of each organization. Parties that are Designated Management Agencies with legal responsibilities for enforcement of land management or water quality rules are indicated with a DMA. Others may provide assistance on a voluntary basis or under the terms of grant funding, or may be sources of funding and/or technical assistance. Various implementation aspects will be addressed based on priority as specific plans are developed or implemented, and as funding is available.

Unincorporated Communities (DMA)
- Upgrade Sewer Networks;
- Ensure Adequate Urban Runoff Treatment and Retention;

Tillamook County: (DMA)
- Review/Revise/Adopt Relevant Ordinances;
- Encourage Protection/Enhancement On Private Lands;
- Assess and Map Riparian and Wetland Habitat;
- Prioritize Floodplain/Lowland Protection/Enhancement Sites;
- Reconnect Sloughs and Rivers to Improve Water Flow;
- Expand Sewer Network;
- Ensure Adequate Urban Runoff Treatment and Retention;
- Ensure Properly Functioning On-Site Sewage Disposal Systems;
- Provide Technical Assistance;
- Provide Funding for Habitat Protection/Enhancement Projects.

Oregon Department of Agriculture: (DMA)
- Implement SB 1010 Agriculture Water Quality Management Plan.
- Implement CAFO Implementation/Enforcement.
- Nutrient Management Plans
- Livestock Management Training.
- Encourage Protection/Enhancement On Private Lands
- Prioritize Floodplain/Lowland Protection/Enhancement Sites.
- Protect and Enhance Freshwater Habitat.
- Effectively Enforce Laws and Regulations;
- Provide technical Assistance;
- Provide Funding for Habitat Protection/Restoration Projects;

Oregon Department of Environmental Quality: (DMA)
- Characterize Riparian and Wetland Habitat;
- Prioritize Floodplain/Lowland Protection/Enhancement Sites;
- Protect and Enhance Freshwater Riparian and Wetland Habitat;
- Characterize Estuarine and Tidal habitat
- Prioritize Tidal Habitat Protection/Enhancement Sites
- Protect and Enhance Tidal Marsh;
- Reconnect Sloughs and Rivers to Improve Water Flow;
- Ensure Properly Functioning On-Site Sewage Disposal Systems;
- Identify Stream Segments Where Rapid Heating Occurs;
- Analyze Instream Flows;
- Prioritize Upland Riparian Protection/Enhancement Sites;
- Effectively Enforce Laws and Regulations;
- NPDES Permitting and Enforcement

- WPCF Permitting and Enforcement
- Provide Technical Assistance;
- Provide 319 Funding For Habitat Protection/Enhancement Projects

Oregon Department of Forestry: (DMA)
- Characterize Riparian and Instream Habitat;
- Prioritize Upland Riparian Protection/Enhancement Sites;
- Protect and Enhance Upland Riparian Sites
- Effectively Enforce Laws and Regulations;
- Forest Practices Act Compliance
- Provide Technical Assistance;
- Provide Funding for Habitat Protection/Enhancement Projects;

U.S. Department of Agriculture – Forest Service (DMA)
- Provide Technical Assistance;
- Provide Funding for Habitat Protection/Enhancement Projects;
- Manage lands pursuant to Standards and Guidelines in the Northwest Forest Plan, Aquatic Conservation Strategy, Coast Range Adaptive Management Area Plan, and the Siuslaw National Forest Land and Resource Management Plan;
- Continue restoration activities as defined in long range plans.

U.S. Department of Interior – Bureau of Land Management: (DMA)
- Provide Technical Assistance;
- Provide Funding for Habitat Protection/Enhancement Projects;
- Manage lands based on the Salem District Record of Decision and Resource Management Plan, as amended by the Standards and Guidelines in the Northwest Forest Plan, Aquatic Conservation Strategy, and the Coast Range Adaptive Management Area Plan;
- Continue restoration activities as defined in long range plans.

Nestucca-Neskowin Watershed Council
- Encourage Protection/Enhancement On Private Lands;
- Characterize Riparian and Instream Habitat;
- Prioritize Floodplain/Lowland Habitat;
- Prioritize Floodplain/Lowland Protection/Enhancement Sites;
- Protect and Enhance Freshwater Wetland Habitat;
- Characterize Estuarine and Tidal Habitats;
- Prioritize Estuarine and Tidal Protection/Enhancement Sites;
- Protect and Enhance Tidal Habitat;
- Remove or Modify Ineffective Tide Gates and Culverts;
- Prioritize Upland Riparian Protection/Enhancement Sites;
- Protect and Enhance Upland Riparian Sites;
- Provide Technical Assistance;
- Provide Funding for Habitat protection/Enhancement Projects.

Tillamook County Soil & Water Conservation District:
- Nutrient Management Plans.
- Livestock Management Training.
- Exclude Livestock From Streams.
- Encourage Protection/Enhancement on Private Lands.
- Prioritize Floodplain/Lowland Protection/Enhancement Sites.
- Protect and Enhance Freshwater Habitat.
- Remove or Modify Ineffective Tide Gates and Culverts;
- Provide technical Assistance.

Oregon Department of Fish and Wildlife:
- Characterize Riparian and Instream Habitat;
- Prioritize Floodplain/Lowland Protection/Enhancement Sites;
- Protect and Enhance Freshwater Riparian and Wetland Habitat;
- Prioritize Tidal Habitat Protection/Enhancement Sites;
- Protect and Enhance Tidal Marsh
- Prioritize Upland Protection/Enhancement Sites
- Protect and Enhance Upland Riparian Sites;
- Effectively Enforce Laws and Regulations;
- Provide Technical Assistance;
- Provide Funding For Habitat Protection/Enhancement projects;

Oregon Division of State Lands:
- Assess and Map Riparian and Wetland Habitat;
- Characterize Riparian and Wetland Habitat;
- Reconnect Sloughs and Rivers to Improve Water Flow;
- Provide Technical Assistance;
- Effectively Enforce Laws and Regulations;

Oregon State University Extension Service:
- Nutrient Management Plans;
- Livestock Management Training;
- Provide technical Assistance;

Oregon State Police:
- Effectively Enforce Laws and Regulations;

Oregon Watershed Enhancement Board:
- Provide Funding for Habitat Protection/Enhancement Projects;

Oregon Wetlands Joint Venture:
- Prioritize Wetlands Protection/Enhancement Sites;
- Protect/Enhance Freshwater Wetlands Habitat;
- Prioritize Estuarine and tidal Habitats;
- Protect and Enhance Tidal Marsh;
- Provide technical Assistance;
- Provide Funding for Wetlands Protection/Enhancement Projects;

Oregon Water Resources Department:
- Analyze Instream Flows;
- Effectively Enforce Laws and Regulations;
- **Provide Technical Assistance;**

U.S. Army Corps of Engineers:
- Reconnect Sloughs and Rivers to Improve Water Flow;
- Provide Technical Assistance;
- Provide Funds for Habitat protection/Enhancement Projects;

U.S. Department of Agriculture Farm Service Agency:
- Provide Technical Assistance;
- Provide Funding for Habitat Protection/Enhancement Projects;

U.S. Environmental Protection Agency:
- Provide technical Assistance;
- Provide 319 Funding for Habitat Protection/Enhancement Projects;

U.S. Natural Resource Conservation Service:
- Develop Voluntary Farm Plans;
- Nutrient Management Plans;
- Increase Incentive Program Payments;
- Provide technical Assistance;
- Provide Funding for Habitat Protection/Enhancement Projects;

ELEMENT 6: REASONABLE ASSURANCE OF IMPLEMENTATION

The Oregon Plan

The Oregon Plan for Salmon and Watersheds is a partnership between Federal and State agencies, local groups and grassroots organizations, that recognizes the attributes of aquatic health and their connection to the health of salmon populations. The Oregon Plan considers the condition of salmon as a critical indicator of ecosystems (CSRI, 1997). The decline of salmon populations has been linked to impoverished ecosystem form and function. The Oregon Plan has committed the State of Oregon to the following obligations: an ecosystem approach that requires consideration of the full range of attributes of aquatic health; focuses on reversing factors for decline by meeting objectives that address these factors; develops adaptive management and a comprehensive monitoring strategy; and relies on citizens and constituent groups in all parts of the restoration process. The intent of the Oregon Plan is to conserve and restore functional elements of the ecosystem that supports fish, wildlife, and people. In essence, the Oregon Plan depends on sustaining a local-state-federal partnership. Specifically, the Oregon Plan is designed to build on existing State and Federal water quality programs, namely: Coastal Zone Non-Pollution Control Programs, the Northwest Forest Plan, Oregon Forest Practices Act, Oregon's Senate 1010 Agriculture Water Quality Management Plans, and Oregon's Total Maximum Daily Load Program. The Oregon plan is a major component of the demonstration of " reasonable assurance " that this TMDL Water Quality Management Plan will be implemented.

The Plan consists of four essential elements:

1. Coordinated Agency Programs:
Many state and federal agencies administer laws, policies, and management programs that have an impact on salmon and water quality. These agencies are responsible for fishery harvest management, production of hatchery fish, water quality, water quantity, and a wide variety of habitat protection, alteration, and restoration activities. Previously, agencies conducted business independently. Water quality and salmon suffered because they were affected by the actions of all the agencies, but no single agency was responsible for comprehensive, life-cycle management. Under the Oregon Plan, all government agencies that impact salmon are accountable for coordinated programs in a manner that is consistent with conservation and restoration efforts.

2. Community-Based Action:
Government, alone, cannot conserve and restore salmon across the landscape. The Oregon plan recognizes that actions to conserve and restore salmon must be worked out by communities and landowners, with local knowledge of problems and ownership in solutions. Watershed councils, soil and water conservation districts, and other grassroots efforts are vehicles for getting the work done. Government programs will provide regulatory and technical support to these

efforts, but local people will do the bulk of the work to conserve and restore watersheds. Education is a fundamental part of the
community based action. People must understand the needs of salmon in order to make informed decisions about how to make changes to their way of life that will accommodate clean water and the needs of fish.

3. Monitoring:
The monitoring program combines an annual appraisal of work accomplished and results achieved. Work plans will be used to determine whether agencies meet their goals as promised. Biological and physical sampling will be conducted to determine whether water quality and salmon habitats and populations respond as expected to conservation and restoration efforts.

4. Appropriate Corrective Measures:
The Oregon Plan includes an explicit process for learning from experience, discussing alternative approaches, and making changes to current programs. The Plan emphasizes improving compliance with existing laws rather than arbitrarily establishing new protective laws. Compliance will be achieved through a combination of education and prioritized enforcement of laws that are expected to yield the greatest benefits for salmon.

Voluntary Measures

There are many voluntary, non-regulatory, watershed improvement programs (Actions) That are in place and are addressing water quality concerns in the Nestucca Bay Basin. Both technical expertise and partial funding are provided through these programs. Examples of actions promoted and accomplished through these programs include: planting of conifers, hardwoods, shrubs, grasses, and forbs along streams; fencing out livestock from riparian areas; protecting or enhancing wetlands; relocating and retiring legacy roads; and replacing tide gates and culverts. The programs addressing these problems include:

- **Nestucca-Neskowin Watershed Council (NNWC)**
- **Tillamook County Performance Partnerships (TCPP).**

The Nestucca-Neskowin Watershed council has been active in the Nestucca Basin since 1997. The Council has developed a Nestucca Basin Watershed Assessment (1998), and a Nestucca Basin Management and Action Plan (1999) in close cooperation with state and federal agencies. local governments, business, and landowners. The Council, in association with the Council Technical Advisory Committee has provided invaluable contributions toward the development of the Nestucca Basin TMDL. The Council has provided a forum for local citizens to meet, plan, discuss actions and alternatives, and select specific projects for completion. The Council will be the focal point for future TMDL implementation activities.

The Tillamook Bay National Estuary Project (TBNEP) worked in close association with state and federal agencies, local governments, businesses, watershed councils, and landowners to develop a Tillamook Bay Basin Comprehensive Conservation Management Plan (CCMP). The plan defines a litany of actions to be taken to protect or enhance water quality and fish habitat. Although the CCMP specifically address the Tillamook Bay, a part of the mission of the TBNEP was to develop information and processes for estuary/watershed evaluation that could be used in other estuaries coast-wide and particularly within Tillamook County. The Tillamook Bay CCMP process has been incorporated into the Nestucca Bay Watershed TMDL Water Quality Management Plan.

The TCPP was formed in 1999 upon the completion of the CCMP to oversee implementation of the Plan. The TCPP is a partnership among local residents, state and federal agencies, local governments, and public interest groups concerned with the management of the Tillamook Bay Basin. The TCPP also provides technical expertise to watershed councils involved in

estuary/watershed programs county-wide. The TCPP will be working closely with the NNWC toward the implementation of the Nestucca Basin WQMP.
The central strategy of the TCPP approach is based upon the belief that a locally based effort to improve coordination, integration and implementation of existing local, state, and federal programs can be effectively protect, enhance, and restore a regional watershed area. The TCPP coordinates efforts to: characterize riparian and wetland habitats; prioritize riparian and wetland sites for protection/enhancement; develop specific project plans and design; provide funding; project implementation; and project monitoring.

The EPA provides funding for TCPP staff and provides oversight to ensure that CCMP goals, objectives, and action items are implemented. A majority of Management Measures identified in this implementation strategy plan are identified as specific action items within the CCMP. This EPA oversight will add additional assurance of implementation.

2. Landowner Assistance Programs

A variety of grants and incentive programs are available to landowners in the Nestucca Bay Watershed. These incentive programs are aimed at improving the health of the watershed, particularly on private lands. They include technical and financial assistance, provided through a mix of state and federal funding. Local natural resource agencies administer this assistance, including the ODF, ODA, ODFW, ODEQ, OWEB, WRD, and NRCS.

Field staff from the administrative agencies provide technical assistance and advice to individual landowners, watershed councils, local governments, and organizations interested in enhancing the Watershed. These services include on-site evaluations, technical project design, stewardship/conservation plans, and referrals for funding as appropriate. This assistance and funding is further assurance of implementation of the TMDL Water Quality Management Plan.

Regulatory/Structured Programs

There are a variety of structured programs that are either in place or will be put in place to help assure that this TMDL WQMP will be implemented. Some of these are traditional regulatory programs such as discharge permit programs for industry. In these cases, the pollutants of concern will be considered and the regulation will be carried out as required by federal, state, or local law. Other programs, while structured, are not strictly regulatory. In these cases, local implementing agencies agree to make a good faith effort to implement the program.

1. NPDES and WPCF Permit Programs

The DEQ administers two different types of wastewater permits in implementing Oregon Revised Statute (ORS) 468B.050. The National Pollutant Discharge Elimination System (NPDES) permits for waste discharge; and Water Pollution Control Facilities (WPCF) are granted by the State of Oregon for waste disposal. The NPDES permit is also a Federal permit, which is required under the Clean Water act for discharge of waste into waters of the United States. DEQ has been delegated authority to issue NPDES permits by the EPA. The WPCF permit is unique to the State of Oregon. As the permits are renewed they will be revised to insure that all 303(d) related issues are addressed in the permit. Hence, these permit activities assure that elements of the TMDL Implementation Strategy involving urban and industrial pollution problems will be implemented.

2. Countywide Regulatory Structure

Oregon cities and counties have authority to regulate land use activities through local comprehensive plans and related development regulations. This authority begins with a broad

charge given to them by the Oregon constitution and the Oregon legislature to protect the public's health, safety, and general welfare.

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

The Oregon land use planning system provides a unique opportunity for local jurisdictions to address water quality protection and enhancement. Many of the goals have a direct connection to water quality, particularly Goals 5 and 6. Tillamook County is currently conducting a periodic review of its Comprehensive Plan. Among the expected changes to this plan will be revised ordinances for the protection of riparian areas. We expect the county to adopt revised ordinances that will be sufficient to meet the allocations in the TMDL

3. **Forestry**

Northwest Forest Plan
In response to environmental concerns and litigation related to timber harvest and other operations on Federal Lands, the United States Forest Service (USFS) and the Bureau of Land Management (BLM) commissioned the Forest Ecosystem Management Assessment Team (FEMAT) to formulate and assess the consequences of management options. The assessment emphasizes producing management alternatives that comply with existing laws and maintaining the highest contribution of economic and social well being. The "backbone" of ecosystem management is recognized as constructing a network of late-successional forests and an interim and long-term scheme that protects aquatic and associated riparian habitats adequate to provide for threatened species and at risk species. Biological objectives of the Northwest Forest Plan include assuring adequate habitat on Federal lands to aid the "recovery" of late-successional forest habitat-associated species listed as threatened under the Endangered Species Act and preventing species from being listed under the Endangered Species Act.

The Northwest Forest Plan is a comprehensive ecosystem management strategy the core components of which include:

- A network of Late-Successional and other reserves distributed across the landscape in which management actions must protect or enhance late-successional forest conditions;
- An aquatic conservation strategy that delineates reserves (buffers) along rivers, streams and other riparian areas, and provides other measures to protect or improve aquatic and riparian habitats;
- A series of broadly stated standards and guidelines that provide guidance for management actions across the entire Northwest Forest Plan area; and
- A series of specific standards and guidelines for management actions outside of reserve areas.

Under the Northwest Forest Plan, strict limits are placed on management activities ranging from road building to harvest. These limits are generally more restrictive than existing state regulations and provide clear protection for riparian forest areas central to the allocations in the TMDLs. More than 2/3 of the Nestucca Bay watershed is managed by the USFS and BLM. Of the forests in this federal land, a large percentage is being managed as "Late Successional Reserve" or "Adaptive Management Area." Although no scheduled harvest is allowed in the

reserves, certain thinning and salvage sales and other multiple use activities may be permitted, provided they maintain or improve the characteristics and purposes of the reserves.

Oregon Forest Practices Act
Oregon's Department of Forestry (ODF) has adopted Forest Practice Administrative Rules (1997) that define allowable actions on State, County and private forestlands. The Oregon Forest Practices Act (FPA, 1994) contains regulatory provisions that include objectives to: classify and protect water resources, reduce the impacts of clearcut harvesting, maintain soil and site productivitiy, ensure successful reforestation, reduce forest management impacts to anadromous fish, conserve and protect water quality and maintain fish and wildlife habitat, develop cooperative monitoring agreements, foster public participation, identify stream restoration projects, recognize the value of biodiversity and monitor/regulate the application of chemicals. Forest Practice Administrative Rules allow revisions and adjustments to the regulatory parameters it contains. Several revisions have been made in previous years and it is expected that the ODF, in conjunction with DEQ, will continue to monitor the success of the Forest Practice Administrative Rules and make appropriate revisions when necessary to address water quality concerns.

4. **Agriculture:**

Senate Bill 1010
Senate Bill 1010 allows the Oregon Department of Agriculture (ODA) to develop Water Quality Management Plans for agriculture lands where such actions are required by State or Federal Law, such as TMDL requirements. The Agriculture Water Quality Management Plan (AWQMP) should be crafted in such a way that landowners in the local area can prevent and control water pollution resulting from agriculture activities. Local stakeholders will be asked to take corrective action against identified problems such as soil erosion, nutrient transport to waterways and degraded riparian areas. It is the ODA's intent to establish AWQMPs on a voluntary basis. However, Senate Bill 1010 allows the ODA to use civil penalties when necessary to enforce against agriculture activity that is found to transgress parameters of an approved Agriculture Water Quality Management Plan. The ODA has expressed a desire to work with the local stakeholders and other State and federal agencies to formulate and enforce Agriculture Water Quality Management Plans.

5. **Oregon Plan**

The State of Oregon has formed a partnership between Federal and State agencies, local groups and grassroots organizations, that recognizes the attributes of aquatic health and their connection to the health of salmon populations. The Oregon Plan considers the condition of salmon as a critical indicator of ecosystems (CSRI, 1997). The decline of salmon populations has been linked to impoverished ecosystem form and function. Clearly stated, the Oregon Plan has committed the State of Oregon to the following obligations: an ecosystem approach that requires consideration of the full range of attributes of aquatic health, focused on reversing factors for decline by meeting objectives that address these factors, develops adaptive management and a comprehensive monitoring strategy, and relies on citizens and constituent groups in all parts od the restoration process. The intent of the Oregon Plan is to conserve and restore functional elements of the ecosystem that supports fish, wildlife, and people. In essence, the Oregon Plan is different from the traditional agency approach, and instead, depends on sustaining a local-state-federal partnership. Specifically, the Oregon Plan is designed to build on existing State and federal water quality programs, namely: Coastal Zone Non-point Pollution Control Programs, the Northwest Forest Plan, Oregon's Forest Practices Act, Oregon's Senate Bill 1010, and Oregon's Total Maximum Daily Load Program.

ELEMENT 7. MONITORING AND EVALUATION

Purpose

Monitoring will provide information on progress being made toward achieving water quality standards. The information generated by each of the agencies/entities gathering data in the Nestucca Bay Watershed will be pooled and used to determine whether management actions are having the desired effects or if changes in the management actions are needed. If progress is not occurring then the appropriate management agency (ODA,ODF, TCSWCD, Municipalities, and Tillamook County) will be contacted with a request for action.

The objective of these monitoring efforts are to demonstrate long-term recovery, better understand natural variability, track implementation of projects and BMPs, and track effectiveness of TMDL implementation. This monitoring and feedback mechanism is a major component of the " reasonable assurance of implementation" for this Plan.

Tracking Implementation of the Plan

Implementation of the Plan will be tracked by accounting for the numbers, types, and locations of projects, BMPs, education activities, or other actions taken to improve or protect water quality. This will be done on an annual basis.

Nestucca-Neskowin Watershed Council/Tillamook County Performance Partnerships

The NNWC in conjunction with the TCPP will take the lead in tracking the implementation of the WQMP. The Council, in cooperation with the TCPP and DEQ will host a Management Conference every two years. The Management Conference shall monitor the effectiveness of actions taken pursuant to the WQMP with the following primary goals:

- measure the effectiveness of the management actions and programs implemented under the WQMP; and
- provide essential information that can be used to redirect and refocus the WQMP during implementation.

Implementation Monitoring

Programmatic implementation monitoring will help keep managers informed regarding the implementation status of various programs and the degree to which programs are not achieving their intended outcomes. With this information, managers can modify the Plan or actions as needed to achieve the desired outcomes outlined in the Plan.

Implementation, or programmatic monitoring is designed to answer such questions as: "is the WQMP being implemented at the level of commitment specified in the WQMP goals, targets, and measures of success?" "Are the actions in the Plan having the desired effects?" " Does the Plan need to be changed?" Many actions in the WQMP lend themselves to this type of administrative monitoring. Implementation monitoring established accountability on the part of the designated lead organizations for specific actions outline in the WQMP.

EFFECTIVENESS MONITORING

Effectiveness monitoring answers broader ecological questions: "Is the ecological integrity of the Bay and watershed changing?" "Is water quality improving or getting worse, and by how much?

Effectiveness monitoring lends itself more toward an assessment of success in obtaining WQMP goals and objectives than to the implementation of specific actions. This type of monitoring requires a statistically sound analysis of environmental data of known quality and confidence. For each WQMP Objective, associated monitoring parameters provide a measurement of success. For example, to monitor the WQMP Objective " Achieve at least a 25% reduction in bacteria loads to rivers", fecal coliform and E. coli bacteria concentrations will be measured at numerous sites in the Basin.

The environmental monitoring component of the Nestucca Bay Monitoring Program (NBMP) is designed to provide data that can be directly compared to the quantifiable objectives in each action item. It builds upon recently conducted characterization studies and existing monitoring efforts. It seeks to promote cooperation among agencies and stakeholders by incorporating and coordinating efforts into an integrated monitoring plan, increasing the scope and resolution of existing efforts, improving the timeliness of data analysis, and making the results available to a diverse group of agencies and stakeholders in a timely manner. This will minimize duplication of effort among agencies, reduce the cost of monitoring, and provide integrated results to the scientific, regulatory, and stakeholder communities in an efficient and timely manner.

Standardized sampling, analytical methods, and quality control (QA/QC) protocols will be adopted to ensure that monitoring information collected by the various partners in this effort are of high quality and are directly comparable.

Monitoring Parameters

Monitoring will be done on a continuing basis for many characteristics in the watershed (NNWC 1999). Some of these will address temperature, sedimentation, bacterial contamination, and beneficial use attainment either directly or indirectly.

Monitoring Parameters:

Bacteria Monitoring;
Temperature Monitoring;
Turbidity Monitoring;
Riparian assessment;
Stream Channel and Habitat Assessments;
Forest Road Surveys; and
Fish Monitoring (Rivers).

Water Quality and Related Parameter Improvements

Bacteria Monitoring

The purpose of the bacteria monitoring program is to determine long-term trends in bacteria loading and short-term variations in bacteria concentrations in relation to DEQ water quality standards.
Major monitoring questions are: Is the concentration (flow-weighted average concentration) of fecal coliform bacteria (FCB) in the lower reaches of the Nestucca, and Little Nestucca Rivers increasing or decreasing (and by how much) during typical storm events during the summer, fall, winter, and spring seasons over time scale of years to decades? Are the storm loads of FCB increasing or decreasing (and by how much) during typical seasonal storm events in the Nestucca, and Little Nestucca Rivers over a scale of years to decades? How often and for what length of time does each of the rivers violate DEQ's water quality criteria for E-coli bacteria? Are there trends in the frequency and/or duration of those water quality standard violations over time scales of years or decades?

The DEQ has monitored bacteria in the Nestucca Bay Watershed for many years. Major sampling efforts have included:

DEQ Ambient Water Quality Monitoring;
DEQ TMDL Development Sampling and Analysis;
Citizen Water Quality Compliance Monitoring;

Temperature Monitoring

The purposes of temperature monitoring are: to determine the daily maximum temperatures of the rivers during summer months. To document changes in the number of days per year that daily maximum temperatures in the rivers exceed water quality criteria; and to determine the spatial extent of water temperature exceedences during summer months in the rivers.

Major monitoring questions are: What is the frequency and duration of temperature excursions above threshold values (expressed as daily maxima) in the rivers and what is the spatial extent of such excursions? Are there trends (increasing or decreasing) in the frequency, duration or extent of temperature excursions above the threshold values in the rivers over time scales of years or decades?

Temperatures in the Nestucca River and numerous tributaries in the Nestucca Basin have been measured above 64°F, temperature conditions in the range of stressful to lethal for salmonid fish. The monitoring program will measure temperature to more precisely quantify the frequency, duration, and extent of temperature excursions above threshold values in each of the rivers. Temperature monitoring by DEQ, and ODF will continue with support from the Nestucca-Neskowin Watershed Council.

Quality Assurance/Quality Control/Data Management

The NNWC, TCSWCD, local, state, and federal agencies, and academic institutions all use data collected in the Nestucca Basin. Data quality must be known to insure that it is of sufficient quality for its intended use.

In general, data will be gathered and handled in accordance with the Oregon Plan for Salmon and Watersheds " Water Quality Monitoring Guide Book", Nestucca Basin Monitoring Program Guidelines, and standard DEQ field monitoring criteria. Special projects or other monitoring efforts will be done in accordance with specific quality assurance plans that identify the precision and accuracy of the data collected. Where this information is not available, the data will be identified as of unknown quality. For educational demonstrations, or screening efforts of lesser quality is sometime collected and still has value. Such data can be included in the data bases and data summaries but will be flagged and its quality identified.

Reporting/Revisions

The Tillamook Bay Watershed Resource Center (TBWRC), NNWC, and DEQ, will be responsible for collating and summarizing data and providing copies of data summaries to the other cooperators on an annual basis. The data will be maintained at the TBWRC and will be available to all interested parties. The NNWC and DEQ will convene a water quality advisory committee to discuss any needed revisions in monitoring strategies and coordinate the coming monitoring season activities.

On a biannual basis, the NNWC and DEQ will produce a report on the status of water quality in the Nestucca Basin. This report will be developed in cooperation with the water quality advisory committee. The agencies involved in implementing this Plan will use this report to adjust the

Water Quality Management Plan over time as appropriate based on trends in monitoring results. Copies of the final report will be made available to the participating agencies, local media, and the general public.

ELEMENT 8: PUBLIC INVOLVEMENT

To be successful at improving water quality a TMDL Implementation Strategy must include a process to involve interested and affected stakeholders in both the development and the implementation of the Plan., These aspects of the plan will largely be implemented by the NNWC and the TCPP In the Nestucca Bay Watershed. This public involvement element of the Plan first describes on-going NNWC public involvement efforts within the Basin. The second section describes on-going efforts with the development of Basin TMDLs. The third section of this element describes a strategy by which the affected agencies/organizations will continue to involve and educate the public during the implementation of the Nestucca Bay Basin Water Quality Management Plan.

On-going Public Involvement Activities

As explained earlier, the Nestucca-Neskowin Watershed Council (NNWC) is currently implementing the public involvement aspects of the Nestucca Basin Water Quality Management Plan (WQMP).

To meet the goals and objectives of the WQMP, the NNWC will continue to foster citizen stewardship through public outreach and education. The NNWC will continue to develop public outreach programs related to forestry, agriculture, and urban and rural residential development. NNWC will also continue work to strengthen K-12 school watershed education programs and improve opportunities for adult education.

On-going activities include:

- Public presentations;
- Fairs and exhibits;
- Issue forums;
- Signs and displays;
- NNWC web site;
- Videos;
- Newsletters.

TMDL Water Quality Management Plan Development

As a member of the NNWC Technical Advisory Committee, DEQ staff have periodically updated the partners on TMDL development efforts. The DEQ has also worked closely with NNWC and others to gather needed data. In May, 2001, DEQ requested that a NNWC Task Force be established to work with DEQ in the development of the final TMDL and the associated TMDL Water Quality Management Plan. The Task Force has met with DEQ TMDL staff and will continue to work closely with DEQ to finalize both the TMDL and WQMP.

Plan Implementation

As mentioned previously, public awareness and involvement will be crucial to the successful implementation of this plan and resulting improvements to water quality. Much of this will be done by the NNWC, though some other aspects will be done by the DMAs and TCPP for county-wide issues. The plan depends on voluntary implementation by landowners for many aspects of water quality protection and restoration. The following actions will take place during the implementation of this Plan:

Urban and Rural Residential

The primary message conveyed to citizens will be that everyone is a contributor to the water quality in the Basin and everyone needs to participate in the efforts to improve water quality. All citizens can participate by using less fertilizer and garden chemicals, washing vehicles on the lawn, keeping wastes of all kinds out of storm drains, drainage ditches, and similar measurers. Special emphasis will be given to protection of riparian vegetation, especially retention of trees along the rivers and urban streams. Additional efforts will be directed toward problems associated with new construction and development activities. Development should be designed to protect and retain vegetation, minimize impervious surfaces, and retain stormwater on-site to the extent possible.

Tillamook County and local municipalities will work with the NNWC and DEQ to develop programs and materials related to the WQMP action items that affect these areas. Actions that have been identified are:

City and County informational mailings;
Stormdrain stenciling;
Displays in public places;
Public service announcements;
Outreach to county planning departments; and
Outreach to city and county public works departments.

Forestry

The primary message conveyed to the forestry community will be that compliance with water quality standards and load allocations during commercial activities on non-federal forestlands will continue to be achieved through compliance with Best Management Practices (BMPs) established under the Forest Practices Act and forest practice rules. Consistent with the DEQ/ODF Memorandum of Understanding, the Act and BMPs may be modified in the future to better ensure water quality standard compliance. If and when such changes occur, forest landowners and operators will be expected to comply with those revised requirements as well.

The Oregon Department of Forestry in close association with the forest industry and small woodlot owners, will work with the NNWC and DEQ to accomplish the following objectives:

- To clearly explain and exchange information regarding the non-federal forestlands component of the Implementation Strategy in order to build understanding, acceptance, and support for the Plan;

- To clearly explain and exchange information on the other components of The Plan and how other users are affected.

- To exchange information and encourage cooperative monitoring efforts that can lead to further improvements in the non-federal forestland areas and/or the overall Plan in the future.

- To encourage forestry community involvement in future revisions of the non-federal forestland areas.

Agriculture

The primary message to agriculture landowners and operators will be that compliance with water quality standards and load allocations will be achieved through compliance with the provisions of the SB 1010 Agriculture Water Quality Management Plan and associated rules.

The Oregon Department of Agriculture (ODA) in association with the agriculture industry and landowners, will work with the NNWC to:

- Educate landowners and public about what SB 1010 is, and how it works;
- Raise awareness of what the prohibited conditions are;
- What the available solutions are; and
- Where financial and technical assistance is available.

Major public outreach efforts will include:

- Public meetings;
- Hearings;
- Direct mail;
- Newsletters;
- Newspaper articles;
- Workshops;
- Project tours;
- Public service announcements; and
- Presentations at community group meetings.

ELEMENT 9: MAINTENANCE OF EFFORT OVER TIME

The purpose of this element of the Implementation Strategy is to demonstrate efforts for maintaining the implementation of the Plan and resulting water quality improvements over the long-term.

To ensure the long-term implementation of the Plan, DEQ will work with the DMAs and the NNWC to oversee plan implementation, review plan priorities and practices, and encourage public education and involvement. The review group will be made up of private citizens and representatives of management agencies involved in the implementation of the Plan. At a minimum, the membership will include:

- Tillamook County government;
- Local Municipalities
- Nestucca-Neskowin Watershed Council;
- Tillamook County Soil & Water Conservation District;
- Oregon Department of Agriculture
- Oregon Department of Forestry;
- Oregon Department of Fish & Wildlife;
- Oregon Department of Environmental Quality;
- US Forest Service – Hebo Ranger District
- Bureau of Land Management – Tillamook Resource Area; and
- Private citizens.

The review group's major charge will be to periodically review the entire plan and revise as necessary. This will involve:

1. Review of the activities of the responsible agencies to determine if implementation is occurring as planned. If it is not, determine the reason and revise the plan timeline as necessary.

2. Promotion of ongoing communication and education among the public on the goals of the plan and on the availability of financial and technical assistance for implementing priority projects.

3. Continuing efforts to encourage adequate technical and financial assistance programs that are active in the Basin to help implement resource enhancement projects.

ELEMENT 10: COSTS AND FUNDING

The purpose of this element is to describe estimated costs and demonstrate there is sufficient funding available to begin implementation of the Implementation strategy. Another purpose is to identify potential future funding sources for project implementation. There are many natural resource enhancement efforts and projects occurring in the Basin which are relevant to the goals of the plan. These efforts, in addition to proposed future actions are described in the Management Measurers element of this Plan. The following table lists the action items described in the Management Measures Element and estimated costs.

Implementation Actions

Approximate Cost

Action 1: Define implement, Enforce pollution control measures on Agricultural land — $25,000/year

Action 2: Implement Voluntary Farm Management Plans — $250,000

Action 3: Implement Revised CAFO Inspection procedures. — Implemented 2000

Action 4:Provide Farm Management Training. — $10,000/yr

Action 5: Control Livestock Access to stream — $1,300,000

Action 6: Encourage Protection /Enhancement on Private Lands. — $10,000/yr

Action 7: Revise Local Ordinances to Increase Protection of Riparian and Wetland Habitat. — NA

Action 8: Reconnect Sloughs and Rivers to Improve Water Flow. — Variable by project

Action 9: Ensure Minimum Streamflows. — NA – Enforcement Issue

Action 10: Assess and Map Riparian Habitat — $30,000

Action 11: Prioritize Upland Riparian Protection/Enhancement Sites	$15,000
Action 12: Protect/Enhance Upland Riparian Areas	$500,000 (coordinated with Action 5)
Action 13: Protect/Enhance Lowland Riparian Areas	$800,000 (coordinated with Action 5)

Point Sources

Action 1: Develop NPDES discharge permits with effluent limits that meet TMDL allocations.	NA Enforcement Issue
Action 2: Ensure Adequate Urban Runoff Treatment and Retention.	$200,000
Action 3: Ensure Properly Functioning On-Site Sewage Disposal Systems. (for survey)	$30,000

Monitoring

The water quality monitoring effort described in Element 7 is comprise of key actions identified by the agencies for documenting and understanding the long-term water quality trends in the Nestucca Basin. This monitoring is already underway and is expected to continue at this level. Cost estimates are identified below.

Monitoring Parameter	Estimated Costs
Bacteria monitoring	$25,000/year (compliance
Temperature	$8,000 /year (staff & equipment)
Total Annual Anticipated Costs	$33,000

Potential Sources of Project Funding

Funding is essential to implementing projects associated with this Implementation Strategy. There are many sources of local, state, and federal funds. The following is a partial list of assistance programs available in the Nestucca Bay Watershed.

Program	Agency/Source
OREGON PLAN FOR SALMON AND WATERSHEDS	**OWEB**
Environmental Quality Incentives Program	USDA-NRCS
Wetland Reserve Program	USDA-NRCS
Conservation Reserve Enhancement Program	USDA-NRCS
Stewardship Incentive Program	ODF
Access and Habitat Program	ODFW
Partners for Wildlife Program	USDI-FSA
Conservation Implementation Grants	ODA
Water Projects	WRD
Nonpoint Source Water Quality Control (EPA 319)	ODEQ-EPA
Riparian Restoration	TCCA
Riparian Protection/Enhancement	COE
forestlands Protection/Enhancement	NFF
Wetlands/Riparian Enhancement	NFWF

ELEMENT 11: LEGAL AUTHORITIES TO BE USED

Clean Water Act Section 303(d)

Section 303(d) of the federal Clean Water Act (CWA) as amended, requires states to develop a list of rivers, streams, and lakes that cannot meet water quality standards without application of additional pollution controls beyond the existing requirements on industrial sources and sewage treatment plants. Waters that need this additional help are referred to as "water quality limited" (WQL). Water quality limited waterbodies must be identified by the Environmental Protection Agency (EPA) or by a delegated state agency. In Oregon, this responsibility rests with the Department of Environmental Quality. The DEQ updates the list of water quality limited waters every two years. The list is referred to as the 303(d) list. The CWA section 303 further requites that Total Daily Maximum Loads (TMDLs) be developed for all waters on the 303(d) list. A TMDL defines the amount of pollution that can be present in the waterbody without causing water quality standards to be violated. A TMDL Water Quality Management Plan is developed to describe a strategy for reducing water pollution to the level of the TMDL, which will restore the water quality and result in compliance with the water quality standards.

NPDES and WPCF Permit Programs

The Oregon Department of Environmental Quality (DEQ) administers two different types of wastewater permits in implementing Oregon Revised Statute (ORS) 468B.050. These are: the National Pollution Discharge Elimination System (NPDES) permits for waste discharge; and Water Pollution Control Facilities (WPCF) permits for waste disposal. The NPDES permit is also a Federal permit and is required under the Clean Water Act. The WPCF permit is a state program. As permits are renewed they will be revised to insure that all 303(d) related issues are addressed in the permit.

Oregon Administrative Rules

Specific rules and authority regarding water quality and its management in the State of Oregon are contained in the Oregon Administrative Rules. A complete collection of the administrative rules relevant to listed waters in the Nestucca Bay Watershed are in Appendix C. Selected rules of interest are:

- Bacteria in Shellfish Waters — OAR 340-41-205(2)(e)(A)(ii)
- Recreational Contact in Waters — OAR 340-41-205(2)(e)(A)(I)
- Water Temperature — OAR 340-41-205(2)(b)
- Sedimentation — OAR 340-41-205(2)(j)

Oregon Forest Practices Act

The Oregon Forest Practices Act (FPA, 1994) contains regulatory provisions that include the objectives to classify and protect water resources, reduce the impacts of clearcut harvesting, maintain soil and site productivity, ensure successful reforestation, reduce forest management impacts to anadromous fish and wildlife habitat, develop cooperative monitoring agreements, foster public participation, identify stream restoration projects, recognize the value of biodiversity, and monitor/regulate the application of chemicals. Oregon's Department of Forestry (ODF) has adopted Forest Practice Administrative Rules (1997) that define allowable actions on State, County, and private forestlands. Forest Practice Administrative Rules allow revisions and adjustments to the regulatory parameters it contains. Several revisions have been made in previous years and it is expected that the ODF, in conjunction with DEQ, will continue to monitor the success of the Forest Practice Administrative Rules and make appropriate revisions when necessary to address water quality concerns.

Northwest Forest Plan

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Management (BLM) commissioned the Forest Ecosystem Management Assessment Team (FEMAT) to formulate and assess the consequences of management options. The assessment emphasizes producing management alternatives that comply with existing laws and maintaining the highest contribution of economic and social well being. The "backbone" of ecosystem management is recognized as constructing a network of late-successional forests and an interim and long-term scheme that protects aquatic and associated riparian habitats adequate to provide for threatened species and at risk species. Biological objectives of the Northwest Forest Plan include assuring adequate habitat on Federal lands to aid the "recovery" of late-successional forest habitat-associated species listed as threatened under the Endangered Species Act and preventing species from being listed under the Endangered Species Act.

Senate Bill 1010

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Ordinances

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

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

The Oregon land use planning system provides a unique opportunity for local jurisdictions to address water quality protection and enhancement. Many of the goals have a direct connection to water quality, particularly Goals 5 and 6. Tillamook County is currently conducting a periodic review of its Comprehensive Plan. Among the expected changes to this plan will be revised ordinances for the protection of riparian areas. We expect the county to adopt revised ordinances that will be sufficient to meet the allocations in the TMDL

ELEMENT 12: ESTIMATE OF TIME TO MEET WATER QUALITY STANDARDS

Estimates of time for meeting standards and full protection of beneficial uses were made based on existing plans (bacteria) or estimates of vegetational growth (temperature and sedimentation). Bacteria estimates are based on the timeline in Element 4 of the WQMP. Temperature and sedimentation improvements are dependent on growth of riparian vegetation and other management actions. The longest-term treatment is restoration of riparian vegetation where needed to provide system potential shade. Vegetation should stabilize streambanks sooner than it will provide system potential shade. Time scales are approximate and implementation will occur as specific plans are implemented or developed, and as funding becomes available

Bacteria: Achieve water quality standards in the rivers and Bay by 2010.

Temperature: Achieve instream temperatures that meet salmonid requirements by 2050

Sedimentation: Achieve Streambed fines target throughout watershed by 2020

ELEMENT 13: MILESTONES FOR MEASURING PROGRESS

General action items are described in Element 3, Management Measures section. Greater detail is available in source documents, including the Nestucca Neskowin Watershed Council Management and Action Plan (Attached), and the Tillamook Bay National Estuary Project Comprehensive Conservation and Management Plan (TBNEP 1999).

The NNWC in cooperation with DEQ will convene a biannual Management Review Group. The Group will review the actions, study water quality trends, and identify adapt actions as necessary to ensure the WQMP is moving forward on schedule.

ELEMENT 14: PLANS FOR REVISING THE TMDL

The Department is committing to a watershed Process wherby the TMDL will be reviewed and, if needed modified or added to on a five-year schedule. This review will precede the renewal of discharge permits so that new information can be put to the task of setting effluent limits. It is anticipated that the next review of the TMDLs in the North Coast Basin will begin in 2005.

APPENDIX D-1
NESTUCCA NESKOWIN WATERSHED COUNCIL MANAGEMENT AND ACTION PLAN