3. INVENTORY

3.1 Overview

The inventory for the Mainstem Lower Columbia and Columbia River Estuary subbasins is structured in two sections. The first—Agencies and Authorities—provides details on the many interests in the two-subbasin area. The second section—Programs, Plans and Projects—provides additional details on key activities that have or are occurring in the subbasins.

The Lower Columbia Fish Recovery Board, a partner in this subbasin planning effort, also has compiled an inventory for its 11 subbasins, which includes information on the Lower Columbia River mainstem and estuary. This information is included LCFRB's Lower Columbia Salmon and Steelhead Recovery and Subbasin Plan Technical Foundation, Volume 4: Programs and Projects Directory.

3.2 Agencies and Authorities

Numerous government agencies and nongovernmental bodies have authority over and/or engage in activities that impact the Lower Columbia River mainstem and estuary subbasins. Federal, state, regional, county, local and tribal governments all have functions that affect the subbasins. In addition, many nongovernmental agencies have active roles within the Lower Columbia River basin.

Amended from the Lower Columbia River Estuary Partnership Comprehensive and Management Plan (June 1999), this section summarizes authorities of 19 federal, 20 state (12 Oregon, eight Washington), 13 regional and more than 40 local agencies. Four tribes also have interests in specific portions of the subbasins. Additionally, at least 46 nongovernmental agencies in Washington and Oregon are active in the Lower Columbia mainstem and estuary.

These agencies and groups are listed along with reference pages in the table 3-1.

Table 3-1: Reference table for agencies and authorities

3.2.1 Federal Government Agencies 3-4
3.2.1.1 U.S. Department of Agriculture: Cooperative State Research, Education, And Extension Service 3-4
3.2.1.2 U.S. Department of Agriculture: Forest Service 3-5
3.2.1.3 U.S. Department of Agriculture: Natural Resources Conservation Service (NRCS) 3-5
3.2.1.4 U.S. Department of Commerce: National Oceanic And Atmospheric Administration 3-6
3.2.1.5 U.S. Department of Commerce: National Oceanic and Atmospheric Administration's National Ocean Service 3-8
3.1.1.2 U.S. Department of Defense: U.S. Army Corps of Engineers 3-8
3.1.1.3 U.S. Department of Energy: Bonneville Power Administration 3-9
3.1.1.4 U.S. Department of the Interior: Bureau of Reclamation 3-11
3.1.1.5 U.S. Department of the Interior: National Park Service 3-12
3.1.1.6 U.S. Department of the Interior: U.S Fish and Wildife Service 3-13
3.1.1.7 U.S. Department of the Interior: U.S. Geological Survey 3-14
3.1.1.8 U.S. Department of Transportation: Federal Highway Administration 3-16
3.1.1.9 U.S. Department of Transportation: U.S. Coast Guard 3-16
3.1.1.10 U.S. Environmental Protection Agency 3-16
3.1.2 State of Oregon Government Agencies 3-18
3.1.2.1 Oregon Department of Agriculture 3-18
3.1.2.2 Oregon Department of Environmental Quality 3-19
3.1.2.3 Oregon Department of Fish And Wildlife 3-20
3.1.2.4 Oregon Department of Forestry 3-21
3.1.2.5 Oregon Department of Human Resources: Oregon Health Division 3-23
3.1.2.6 Oregon Department of Land Conservation And Development 3-23
3.1.2.7 Oregon Department of Transportation 3-25
3.1.2.8 Oregon Division of State Lands 3-25
3.1.2.9 Oregon Governor's Watershed Enhancement Board 3-26
3.1.2.10 Oregon Marine Board 3-27
3.1.2.11 Oregon office of Energy 3-27
3.1.2.12 Oregon Parks and Recreation Department 3-28
3.1.2.13 Oregon Water Resources Department 3-29
3.1.3 State of Washington Government Agencies 3-30
3.1.3.1 Washington Conservation Commission 3-30
3.1.3.2 Washington Department of Agriculture 3-30
3.1.3.3 Washington Department of Community, Trade, And Economic Development 3-31
3.1.3.4 Washington Department of Ecology 3-31
3.1.3.5 Washington Department of Fish And Wildlife 3-33
3.1.3.6 Washington Department of Health 3-34
3.1.3.7 Washington Department of Natural Resources 3-34
3.1.3.8 Washington Department of Transportation 3-35
3.1.3.9 Washington Parks And Recreation Commission 3-35
3.1.4 Regional Agencies: Associations and Councils 3-36
3.1.4.1 Association of Clean Water Agencies 3-36
3.1.4.2 Columbia Basin Fish and Wildlife Authority 3-37
3.1.4.3 Columbia River Estuary Study Taskforce 3-37
3.1.4.4 Cowlitz-Wahkiakum Council of Governments 3-38
3.1.4.5 Marine Education and Research Training Station 3-38
3.1.4.6 Oregon Watershed Improvement Coalition 3-38
3.1.4.7 Water Resources Education Center 3-39
3.1.5 Regional Agencies: Quasi-Governmental Organizations and Compacts 3-39
3.1.5.1 Lower Columbia Estuary Partnership (LCREP) 3-39
3.1.5.2 Pacific Fishery Management Council 3-39
3.1.5.3 Pacific States Marine Fisheries Commission 3-40
3.1.5.4 Northwest Power Planning Council 3-41
3.1.6 Regional Agencies 3-41

3.1.6.1 Columbia River Gorge Commission 3-41
3.1.6.2 Columbia River Inter-Tribal Fish Commission 3-42
3.1.6.3 Metro 3-42
3.1.6.4 Clean Water Services (Formerly Unified Sewerage Agency) 3-43
3.1.7 Oregon Local Government Agencies 3-44
3.1.7.1 Oregon's Statewide Planning Goals And Guidelines 3-44
3.1.7.2 Clackamas County 3-46
3.1.7.3 Clatsop County 3-47
3.1.7.4 Columbia County 3-47
3.1.7.5 Hood River County 3-48
3.1.7.6 Multnomah County 3-49
3.1.7.7 Washington County 3-49
3.1.7.8 City of Astoria 3-50
3.1.7.9 City of Cascade Locks 3-51
3.1.7.10 City of Clatskanie 3-52
3.1.7.11 City of Columbia City 3-52
3.1.7.12 City of Fairview 3-53
3.1.7.13 City of Gladstone 3-54
3.1.7.14 City of Gresham 3-54
3.1.7.15 City of Hood River 3-56
3.1.7.16 City of Lake Oswego 3-56
3.1.7.17 City of Milwaukie 3-57
3.1.7.18 City of Oregon City 3-58
3.1.7.19 City of Portland 3-58
3.1.7.20 City of Rainier 3-60
3.1.7.21 City of Scappoose 3-60
3.1.7.22 City of St. Helens 3-61
3.1.7.23 City of Troutdale 3-61
3.1.7.24 City of Warrenton 3-62
3.1.7.25 City of West Linn 3-63
3.1.8 Washington Local Government Agencies 3-64
3.1.8.1 Washington's Land Use Regulations 3-64
3.1.8.2 Clark County 3-65
3.1.8.3 Cowlitz County 3-66
3.1.8.4 Pacific County 3-66
3.1.8.5 Skamania County 3-66
3.1.8.6 Wahkiakum County 3-67
3.1.8.7 City of Camas 3-67
3.1.8.8 City of Cathlamet 3-68
3.1.8.9 City of Ilwaco 3-68
3.1.8.10 City of Kalama 3-68
3.1.8.11 City of Kelso 3-69
3.1.8.12 City of Longview 3-69
3.1.8.13 City of North Bonneville 3-70
3.1.8.14 City of Ridgefield 3-70
3.1.8.15 City of Stevenson 3-71
3.1.8.16 City of Vancouver 3-71
3.1.8.17 City of Washougal 3-72
3.1.8.18 City of Woodland 3-72
3.1.9 Tribal Governments 3-73
3.1.9.1 Nez Perce Tribe: 3-73
3.1.9.2 Confederated Tribes of theUmatilla Indian Reservation: 3-73
3.1.9.3 Confederated Tribes of theWarm Springs Indian Reservation of Oregon: 3-73
3.1.9.4 Confederated Tribes And Bands of theYakama Indian Nation: 3-74
3.1.10 Non-Governmental Agencies 3-74
3.1.11 Port Districts 3-78

3.1.11.1 Oregon Ports 3-78
3.1.11.2 Washington Ports 3-79

3.2.1 *Federal Government Agencies*

3.2.1.1 U.S. Department of Agriculture: Cooperative State Research, Education, And Extension Service

The Cooperative State Research, Education, and Extension Service is one of the United States Department of Agriculture's (USDA) organizations designed to address soil conservation and agricultural impacts on water quality. The agency's two focal areas that are relevant to water quality are agriculture and natural resources, and community and rural development. Conservation work is provided through a cooperative effort among this federal agency, state extension services, and county extension agents. This service emphasizes the use of Best Management Practices (BMP's) through field demonstrations, public education, and outreach programs. The Extension Service has two general program areas that relate to the estuary study area:

3.2.1.1.1 Plant Production and Protection Programs:

- Administers the National Biological Impact Assessment Program which addresses safe and appropriate applications of biotechnology to agriculture
- Conducts Integrated Pest Management (IPM) programs and activities
- Manages the National Agricultural Pesticide Impact Assessment Program

3.2.1.1.2 Research Programs:

- Manages the National Research Initiative, which supports research aimed at solving key agricultural and environmental problems
- Addresses issues concerning plant and animal genomes, water quality, human nutrition, food safety, and animal and plant systems
- Coordinates educational programs based on findings of research

3.2.1.1.3 U.S. Department of Agriculture: Farm Service Agency (Fsa)

The Farm Service Agency (FSA) is one of USDA's organizations designed to address soil conservation and agricultural impacts on water quality. FSA administers the Soil Conservation Domestic Allocation Act, the "Swampbuster" and "Sodbuster" provisions of the 1985 Food Security Act, and the following environmental conservation programs:

3.2.1.1.4 Conservation Reserve Program:

- Conserves and improves soil and water quality by reducing soil erosion and sedimentation
- Encourages farmers to discontinue growing crops on highly erodible lands
- Identifies wildlife habitat to be set aside for preservation purposes
- Removes highly erodible croplands and wetlands from production by financially
- reimbursing program participants

3.2.1.1.5 Emergency Conservation Program:

- Allows farmers to rehabilitate farmland destroyed by wind erosion, floods or other natural disasters
- Enables farmers to perform emergency conservation measures to prevent damage to lands

3.2.1.1.6 Farm Debt Cancellation-Conservation Easement Program:

- Protects marginal and sensitive lands by purchasing easements for conservation, recreation, and wildlife habitat
- Allows debt cancellation for program participants in exchange for conservation easements

3.2.1.1.7 Water Bank Program:

- Protects important waterfowl habitat by authorizing payments for preventing wetland loss and preserving inland freshwater
- Conserves surface waters, reduces runoff and erosion, provides flood control assistance, enhances natural beauty of the landscape
- Provides funds for small flood control projects to protect agricultural lands

3.2.1.2 U.S. Department of Agriculture: Forest Service

3.2.1.3 U.S. Department of Agriculture: Natural Resources Conservation Service (NRCS)

Formerly the Soil Conservation Service, The Natural Resources Conservation Service (NRCS) is one of USDA's technical agencies designed to address soil conservation and agricultural impacts on water quality. NRCS focuses its assistance on non-federal lands, and works primarily with private land owners in implementing water and soil erosion-reducing programs to protect water quality. The main NRCS activities are:

3.2.1.3.1 Farmland Protection Program:

- Protects prime and unique farmland from conversion to non-agricultural uses

3.2.1.3.2 Forestry Incentives Program:

- FIP is a cost-share program designed to increase forest production by increasing tree planting; timber stand improvement, and other related practices on non-industrial private forest lands

3.2.1.3.3 Reduction of Runoff and Erosion Control:

- offers grants and training to farmers regarding best management practices to reduce runoff and control erosion

3.2.1.3.4 Resource Conservation and Development Program:

- Encourages the capability of state and local government agencies and nonprofit organizations in rural areas to develop programs for resource conservation and community sustainability
- Provides water supply forecasting services

3.2.1.3.5 Watershed Protection and Flood Prevention:

- Provides financial and technical assistance to state and local governments in watershed protection
- Develops watershed restoration plans focusing on ways to improve salmon habitat 6) Wetland Identification and Protection Program:
- Assists private landowners and others in protecting and restoring wetlands, and developing wildlife habitats

3.2.1.3.6 Wetland Reserve Program:

- offers agricultural landowners an opportunity to receive payments for restoring and protecting wetlands
- Provides cost share funds for restoration and the purchase of conservation easements

3.2.1.3.7 Technical Assistance Programs:

Provides planning assistance to landowners, groups, federal, state, and local governments to inventory natural resources and apply conservation practices needed to protect and enhance those resources

- offers irrigation water management technical assistance
- Provides private landowners with technical and financial assistance in conservation planning and implementation (integrated crop and pest management, confined-animal feeding operations)
- Provides technical assistance for the Governor's Watershed Enhancement Board program

3.2.1.3.8 Urban Resources Partnership:

- Sets up partnerships with government agencies, nonprofit organizations, and community groups to implement natural resource projects in urban areas

3.2.1.3.9 Wildlife Habitat Incentives Program:

- Provides technical and financial assistance to landowners to improve wildlife habitat

3.2.1.4 U.S. Department of Commerce: National Oceanic And Atmospheric Administration

National Oceanic and Atmospheric Administration (NOAA) is the principal federal agency that develops and distributes scientific information related to estuaries and coastal ocean waters. The agency's main responsibilities involve research, data collection and assessment, and management. NOAA has developed an array of programs to address coastal issues. Some of these programs include:

3.2.1.4.1 Coastal Zone Management Program:

- Assists federally approved coastal states in effectively managing the nation's coastal zone by balancing competing demands
- Provides oversight for state Coastal Zone Management Act (CZMA) programs 2) Marine Sanctuary Program:

3.2.1.4.2 Marine Sanctuary Program

- Identifies sensitive marine environments and provides authority for coordinated conservation and management of these areas
- Supports scientific research and public education programs concerning marine environments

3.2.1.4.3 National Estuaries Research Reserve System:

- Manages a national system of reserves which represents different coastal regions and estuarine types

3.2.1.4.4 U.S. Department of Commerce: National Oceanic And Atmospheric Administration's National Marine Fisheries Service

The National Marine Fisheries Service (NMFS) is an agency of the National Oceanic and Atmospheric Administration (NOAA). NMFS is responsible for the assessment and management of marine resources through the regulation of fisheries. NMFS fishery managers and scientists participate in international treaties and agreements, and create national partnerships to conserve living marine resources. NMFS emphasizes preservation of habitat as an essential way to protect species. NMFS works in numerous areas that directly impact the nation's water resources. These include:

3.2.1.4.5 Fishery Management:

- Works with Fishery Management Councils to develop and coordinate Fishery Management Plans for all species under federal jurisdiction
- Monitors fishery landings and fishing efforts by compiling and analyzing relevant statistics of U.S. territorial seas
- Analyzes federal projects, permits, and license proposals
- Provides recommendations to protect, mitigate, and enhance anadromous fish resources
- Participates in fish management planning actions sponsored by the Northwest Power Planning Council

3.2.1.4.6 Habitat Conservation and Species Management:

- Monitors and protects the health of the nation's estuarine marshes, coral reefs, seagrass beds, and mangroves by reviewing permits, legislation, and future activities that will affect fish and wildlife habitat
- Conducts research on the ecological importance of estuaries, and provides recommendations for reduced impact through the Habitat Conservation Program
- Shares management of NOAA's Damage Assessment and Restoration Program
- Works to recover resources that impact the health of endangered/threatened species

3.2.1.4.7 Seafood Safety and Inspection:

- Inspects hundreds of seafood distributor plants to ensure that their products are safe for human consumption
- Works cooperatively with other nations to guarantee seafood safety

3.2.1.4.8 Technical Assistance:

- Provides technical assistance to state and federal agencies regarding the effects of water quality parameters on resources of concern

- Performs damage assessments for chemical spills that affect relevant resources
- Administers coastal zone planning, permit, and hydroelectric project reviews

3.2.1.4.9 Water Management:

- Provides recommendations to the Army Corps of Engineers on dredge and fill permits
- Reviews instream flow studies associated with federally permitted actions

3.2.1.5 U.S. Department of Commerce: National Oceanic and Atmospheric Administration's National Ocean Service

The National Ocean Service (NOS) also is managed under the auspices of NOAA. NOS is primarily interested in estuarine and coastal water navigation. Most of the National Ocean Service's authority is derived from the following two laws:

3.2.1.5.1 Coastal Zone Management Act of 1972:

- Provides financial support, policy guidance, and technical assistance to coastal states in an effort to promote the protection of water resources and coastal land
- Establishes a state-federal partnership in managing coastal resources
- Works with coastal states to develop and maintain coastal zone management programs

3.2.1.5.2 Coastal Zone Act Reauthorization Amendments:

- Requires states to develop coastal nonpoint programs which must be approved by NOAA and EPA

  Assures consistency between state and federal coastal zone management and water quality programs
- NOS also has a role in tidal current prediction and in nautical charting. NOS has a number of programs related to coastal management. These programs have been grouped into the following two areas:

3.1.1.1.1 Estuarine Assessment:

- Produces inventories of multiple uses related to pollution discharge, coastal wetlands, and estuaries under Strategic Environmental Assessments Division (SEA)
- Develops geographical information systems under SEA
- Creates strategic environmental assessments which aim to balance conservation needs with use demands under SEA

3.1.1.1.2 office of Ocean and Coastal Resources Management:

- Administers the federal Coastal Zone Management Program and the Coastal Nonpoint Pollution Control Program
- Promotes low-impact use of the U.S. coastal zone, provides funding to coordinate management planning, and manages and supports estuarine reserves

3.1.1.2 U.S. Department of Defense: U.S. Army Corps of Engineers

The Army Corps of Engineers provides engineering and planning services and construction support for a wide variety of military and civilian projects. The Corps' primary role is to develop and manage the country's waterways and wetlands. Its projects reduce flood

damage, improve harbors and navigation channels, protect stream banks and shorelines, restore ecosystems, and other activities aimed at protecting watersheds and the environment. The following is a list ofprograms and activities relevant to the Lower Columbia River estuary:

3.1.1.2.1 Resource Management Programs:

- Conducts fish, wildlife, environmental, and cultural studies and project resource management
- Administers natural resources/master planning
- Assists with fish passage research, mitigation, funding, and coordination
- Provides habitat inventory and analysis
- ESA compliance
- Works on water quality and water supply issues

3.1.1.2.2 Flood Damage Reduction Control Programs:

- Conducts flood damage reduction, flood plain management and preparedness planning, and shoreline protection
- Implements flood damage reduction projects and operates reservoirs
- Provides emergency preparedness assistance and response for floods and other natural disasters
- Conducts hydrologic and hydraulic analyses
- Provides flood control works inspection and flood damage rehabilitation

3.1.1.2.3 Navigation and Dredging Programs:

- Regulates activities involving, and permits structures and work in, navigable waters of the U.S.
- Constructs navigation improvement projects
- Regulates (under Section 404 of the Clean Water Act) activities involving the discharge of dredged material into all waters of the U.S.
- Maintains harbor entrances and navigation channels and structures
- Prepares and implements dredge material management plans
- Evaluates sediments in the federal channel to ensure management practices comply with the Clean Water Act
- Participates in oceanographic and jetty construction studies

3.1.1.2.4 Research and Technical Assistance:

- Conducts comprehensive planning, watershed and environmental restoration studies
- Provides planning assistance to states
- Provides work for others on a cost-reimbursement basis

3.1.1.3 U.S. Department of Energy: Bonneville Power Administration

Bonneville Power Administration (BPA) is an agency of the U.S. Department of Energy responsible for wholesaling electric power generated at 29 federal dams located in the Columbia-Snake River Basin. BPA is a federal utility and one of the five power marketing agencies. Its principal service territory includes the states of Oregon, Washington, Idaho, parts of Montana

and small portions of adjacent states. The Pacific Northwest Electric Power Planning and Conservation Act of 1980 extended BPA's responsibilities to include improvements of fish and wildlife resources and development of conservation resources. The following is a list of BPA's programs that relate to the LCREP:

3.1.1.3.1 Fish and Wildlife Protection Programs:

- Implements the Northwest Power Planning Council's Fish and Wildlife Program for impacts associated with the Federal Columbia River Power System (includes consideration of oceanic and estuarine impacts)
- Implements Endangered Species Act activities associated with the national Marine Fisheries Service and the U.S. Fish and Wildife Services biological opinion's, including estuary, near shore, and ocean salmonid survival
- Engages in hatchery programs and genetics and disease assessments
- Pursues acquisition of water rights needed to support fish hatcheries
- Funds programs to restore fish habitat through the use of water storage and transfers
- Funds the Coordinated Information System and the Northwest Hydropower Data Base to provide standard methods for assessing fish and wildlife data

3.1.1.3.2 Water Management Activities:

- Runs an industrial energy conservation program which funds water system retrofits
- Participates in protection of groundwater related to pesticide use
- Works with the Northwest Power Planning Council to compile hydroelectric power supply curves
- Prepares internal Pollution Abatement Clearances (PAC) for any proposed construction activity or major modification to existing facilities

3.1.1.3.3 U. S Department of Health And Human Services: U.S. Food And Drug Administration

The U.S. Food and Drug Administration (FDA) develops methods for detecting, quantifying, and identifying contaminants in shellfish and estuarine waters. It is the national regulatory authority for public health protection and seafood regulation. It is responsible for establishing and enforcing safe levels for harmful substances in accordance with the Federal Food, Drug and Cosmetic Act. The following is a list of the programs relevant to the estuary study area:

.3.1.1.3.3.1 Low-Acid Canned Food Program:

- Focuses on thermally processed, commercially sterile foods, including seafood and canned salmon and tuna
- National Shellfish Sanitation Program:
- Provides for the harvest and production of fresh and frozen molluscan shellfish
- offers technical assistance to states in studying specific pollution problems
- Provides data to establish closure levels for shellfish harvesting
- Conducts applied research in various contaminants to assist in developing standards and criteria

- Evaluates the effectiveness of state shellfish sanitary control programs

.3.1.1.3.3.2 Salmon Control Plan:

- Provides control over plant sanitation and processing activities
- Addresses concerns involving decomposition in the salmon canning industry

.3.1.1.3.3.3 Seafood Regulatory Program:

- Operates an oversight compliance program for fishery products
- Sets tolerances in foods for natural and human-made contaminants (except for pesticides that are under EPA jurisdiction)
- Provides financial support to state regulatory agencies for the inspection of food plants
- Conducts research regarding the health risks posed by unsafe processing practices

3.1.1.3.4 U.S. Department of the Interior: Bureau of Land Management

The mission of the Bureau of Land Management (BLM) is to sustain the health, diversity and productivity of the public domain lands for the use and enjoyment of present and future generations. One focus of the agency involves assisting states with the development of non-point source pollution plans, and identifying threatened bodies of water. BLM has a number of projectsand activities related to land management and its effects on water quality:

.3.1.1.3.4.1 Land Management Activities:

- Manages federal range and forest lands with respect to water quality and quantity, riparian and watershed restoration, water source development, and water rights
- Prepares, adopts, and implements Wild and Scenic River Management Plans
- Administers the Oregon and California Lands Sustained Yield Act of 1937
- Manages 19 million acres of subsurface minerals in Oregon
- Administers the Federal Land Policy and Management Act of 1976

3.1.1.3.5 Technical Assistance:

- Provides technical assistance on watershed and riparian management issues
- Administers rangeland management research
- Evaluates effects of resource management activities on water management

3.1.1.4 U.S. Department of the Interior: Bureau of Reclamation

The Bureau of Reclamation has traditionally administered federal programs for water resource development and use. In 1987, the Bureau decided to redirect its mission to focus more on the efficient operation of existing projects and resource management issues, and less on water resource development. The Bureau's activities include: hydroelectric power generation; irrigation service; groundwater management; flood control; fish and wildlife enhancement; river regulation and control; water quality and quantity issues; and industrial and municipal water supply. The Bureau also owns and operates the Grand Coulee Dam and many other dams in the Northwest.Some other programs and projects significant to the the staury and mainstem stdy areas are:

3.1.1.4.1 Departmental Irrigation Drainage Program:

- Serves to protect and restore fish and wildlife resources that have been adversely impacted by irrigation systems
- Works to improve the operating efficiencies of irrigation facilities

3.1.1.4.2 Federal Water Projects:

- Coordinates resource management planning
- Monitors water quality relevant to projects
- Provides technical assistance for best management practices (BMP's)
- Implements structural and nonstructural water quality management programs

3.1.1.4.3 Water Supply and Management Studies and Planning Activities:

- Conducts river basin conservation planning, including impact analyses
- Performs recharge studies, conjunctive use studies, and water supply studies
- Conducts planning investigations under the Federal Bureau of Reclamation Project Program
- Performs hydrologic analyses
- Identifies potential watershed and riparian zone enhancement projects through planning studies

3.1.1.5 U.S. Department of the Interior: National Park Service

The National Park Service (NPS) conducts management, enforcement, and research on public lands subject to its jurisdiction. The National Park Service is the steward of some of the nation's most significant natural and cultural resources. The mission of the NPS is to preserve and protect these resources, attributes, and processes within areas of its jurisdiction for future generations to be able to study, learn and enjoy. NPS directs programs to assist other federal agencies, state and local governments, and individuals in the protection of natural, cultural, and archeological resources. Some of these programs include:

3.1.1.5.1 Fort Clatsop National Memorial

- Produces and implements a Resources Management Plan, Water Resources Scoping Report/Plan, and numerous baseline inventories and mapping projects

3.1.1.5.2 Land and Water Conservation Fund:

- Creates and maintains high-quality recreation facilities through grant assistance

3.1.1.5.3 Rivers, Trails, and Conservation Programs:

- Manages instream resources within the national parks to protect the recreational and scenic resources
- Evaluates natural resources values for FERC hydroelectric license applications
- Provides planning expertise to state and local governments in order to conserve rivers and establish trails
- Develops a Master Plan and Land Protection Plan that address protection of park resource values, including significant wetlands, watershed issues, and habitat fragmentation

3.1.1.5.4 Wild and Scenic River Act Projects:

- Maintains the National Rivers Inventory as required by the Act
- Provides technical assistance for Wild and Scenic River eligibility and suitability studies

3.1.1.6 U.S. Department of the Interior: U.S Fish and Wildife Service

The responsibilities of the United States Fish and Wildife Service (USFWS) include protecting and conserving fish and wildlife and their habitats for the benefit of the species. Its major responsibilities include: migratory birds; certain marine mammals; freshwater and anadromous fish; endangered species; wetlands; the National Wildlife Refuge System; and environmental contaminants. Although the agency has no direct regulatory control concerning discharges of pollutants into waters of the United States or discharge of dredge and fill materials, the agency plays a direct advisory role in these regulatory practices. USFWS manages living resources under several statutes, two of which are described below:

3.1.1.6.1 Endangered Species Act of 1973 (ESA):

- Provides for the listing of threatened or endangered plant and animal species
- Designates critical habitat for these species to be protected
- Coordinate actions to restore threatened and endangered species to full reproductive capacity
- Enables USFWS and the National Marine Fisheries Service to protect and conserve the species and their habitats

3.1.1.6.2 The Fish and Wildlife Coordination Act of 1958:

USFWS has a number of programs and projects responsible for enhancing and protecting fish and wildlife. Many of these programs also involve coastal and marine habitat and protection. These include:

- Allows USFWS and the National Marine Fisheries Service to consider and comment on the impacts of water resource/use interests on fish and wildlife species for federal projects in navigable waters
- Guarantees consideration of impacts on fish and wildlife habitats for federal water use projects

3.1.1.6.3 Environmental Contaminants Program

- Estimates damage to natural resources that may occur as a result of oil spills and other contaminants
- Participates in cleanup of contaminants which harm freshwater and anadromous fish and migratory bird species
- Assesses the impacts of point and non-point source pollution on fish and wildlife
- Provides recommendations on best management practices (BMP's) to control nonpoint source pollution
- Repairs damage to living resources in and around Superfund sites
- Conducts research on marine debris effects on seabirds

3.1.1.6.4 Fish Protection and Management:

- Initiates tissue analysis of invertebrates and fish taken from contaminated waters

- Participates in fish management planning actions sponsored by the Northwest Power Planning Council
- Administers Fish and Wildlife Coordination Act
- Provides tax and general funds to state agencies for fish restoration and management

3.1.1.6.5 Wetlands Research:

- Administers the Service's National Wetlands Inventory Program
- Reviews and comments on Section 10/404 permits for projects affecting wetlands
- Funds the restoration and enhancement of private wetlands
- Administers the Small Wetlands Acquisition Program

3.1.1.6.6 Wildlife Protection and Wildlife Refuge System:

- Manages wildlife refuges in Oregon and Washington
- Acquires coastal land to protect significant migratory bird and endangered species habitat, and recreation and wilderness areas
- Administers the National Wildlife Refuge System Technical Assistance Program
- Works with other agencies to ensure the protection of many species of coastal migratory birds and waterfowl

3.1.1.7 U.S. Department of the Interior: U.S. Geological Survey

The mission of the USGS is to provide geologic, topographic, and hydrologic information that contributes to the wise management of the nation's natural resources and that promotes the health, safety, and well-being of the people. USGS's Water Resources Division provides the information and understanding needed to fully address the nation's water resources. Seven relevant USGS programs and studies are:

3.1.1.7.1 Federal State Cooperative Program:

- Conducts water resource investigations for the USGS and state and local agencies
- National Marine and Coastal Geology Program
- Investigates critical geologic issues affecting the nation's coastal and marine realms
- Provides objective scientific information to managers and planners working in coastal and offshore regions
- Co-directs the Southwest Washington Coastal Erosion Study with the Department of Ecology's Shorelands and Water Resources Program

3.1.1.7.2 National Water Quality Assessment Program:

- Provides a nationally consistent description of current water quality conditions of the nation's water resources
- Characterizes trends (or lack of trends) in the quality of the nation's groundwater and surface water
- Studies the natural and human factors that affect water quality

3.1.1.7.3 National Stream Quality Accounting Network:

- Characterizes the concentration and flux of sediment and chemicals in the nation's largest river basins
- Determines regional source areas for chemicals in transport
- Assesses the effect of human influences on observed concentrations and flux

3.1.1.7.4 Toxic Substances Hydrology Program:

- Provides unbiased earth science information on the behavior of toxic substances in water systems
- Conducts intensive field and regional investigations

.3.1.1.7.4.1.1 Water Information Coordination Program:

- Ensures the availability of water information required for effective decision making in natural resource management and environmental protection
- Strives for continual coordination of water information programs
- Publishes approximately 3,000 new or updated reports and maps yearly

.3.1.1.7.4.1.2 Water Quality Studies:

- Evaluates instream flow for areas that can support fish spawning
- Conducts urban hydrology studies to predict changes in runoff
- Studies the effects of impoundments on water quality

3.1.1.7.5 U.S. Department of the Interior: U.S. Geological Survey Biological Resources Division

The National Biological Service (NBS) was created in 1993 by consolidating the biological science programs of seven federal agencies into one entity. It served as the biological research division of the Department of Interior until October 1996, when it became the Biological Resources Division (BRD) of the US Geological Survey. The mission of the division is to work with other agencies to provide the scientific understanding and technologies needed to manage the nation's biological resources. The BRD has two main programs:

.3.1.1.7.5.1 Information and Technological Services:

- Provides access to, and shares, biological resources data and information
- Establishes a National Biological Information Infrastructure that will consist of a network of databases and information sources on biological resources
- Contains two components: Information Management; Information and Technology Transfer

.3.1.1.7.5.2 Inventory and Monitoring:

- Inventories and monitors the nation's biological resources to determine their health and status, and reports the findings to the public
- Publishes a biennial Status and Trends Report to identify existing resources
- Contains three components: Ecosystem Inventory and Assessment; Population Inventory and Monitoring; Inventory Standards and Protocol Development

3.1.1.8 U.S. Department of Transportation: Federal Highway Administration

The Federal Highway Administration is responsible for working with other federal agencies to design and build principal roads in national forests, parks, and Indian reservations. While conducting business in an efficient manner, the agency also strives to have the least impact possible on the natural environment. One of the agency's activities that affects the Columbia mainstem and estuary is:

3.1.1.8.1 Highway Planning and Construction

- Assists state highway agencies in the development of an interconnected transportation system
- Administers provisions for areawide planning, which include wetland activities and highway runoff water quality measures
- Provides funds to mitigate damage to ecosystems

3.1.1.9 U.S. Department of Transportation: U.S. Coast Guard

The United States Coast Guard is one of the five armed forces branches of the federal government. It operates under the Department of Transportation during peacetime. The Coast Guard enforces applicable federal laws and international treaties upon the high seas and under state jurisdiction concerning water safety, water pollution, and spills. The agency also acts as a port safety regulatory agency. The Coast Guard has a role in two areas of importance to the mainstem and estuary study area:

3.1.1.9.1 Marine Waste Management:

- Enforces the provisions of the Marine Pollution Research and Control Act (MARPOL) establishing regulations for vessel waste disposal
- Establishes regulations regarding performance standards for marine sanitation devices, in cooperation with EPA
- • Issues certificates to terminals and ports to properly dispose of solid waste from ships
- Oil Spill Prevention and Response:
- Develops management plans for oil and hazardous spills
- Is involved in prevention activities, research for advancing response techniques, and technical assistance to oil and hazardous substance responses

3.1.1.10 U.S. Environmental Protection Agency

The Environmental Protection Agency (EPA), established on December 2, 1970, protects the nation's rivers, streams, and lakes from pollution by administering federal environmental protection laws. The majority of these laws and programs contribute to water quality protection in the maistem Lower Columbia River and estuary. These include:

3.1.1.10.1 Clean Water Act of 1972 (CWA) as amended:

- Establishes criteria for water quality
- Defines categories of pollutants
- Creates a national permit system
- Controls point source pollution by regulating industrial and municipal wastewater discharges
- Controls some non-point source pollution by regulating confined animal feeding operation discharges and urban stormwater runoff

- Regulates the discharge of dredge and fill material for wetland protection purposes
- Establishes the National Estuary Program

3.1.1.10.2 Clean Air Act of 1970 and 1972 (CAA):

- Establishes maximum acceptable levels of outdoor air pollutants
- Develops standards for new stationary and motor vehicle emissions
- Limits the release of hazardous substances

3.1.1.10.3 Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA):

- Requires EPA to respond immediately to chemical spills and/or releases of any toxic substances which pose potential human or environmental health risks

3.1.1.10.4 Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA):

- Requires states to establish Local Emergency Planning Communities and State Emergency Response Commissions which collect data on hazardous chemicals and prepare procedures for emergency action plans
- Section 313 requires owners of manufacturing plants to report their releases of toxicchemicals in order to establish the Toxic Release Inventory

3.1.1.10.5 Environmental Monitoring and Assessment Program (EMAP):

- Evaluates the effectiveness of national pollution control efforts through interagency monitoring activities
- Federal Insecticide, Fungicide, and Rodenticide Act of 1982 (FIFRA):
- Regulates the licensing of pesticide programs and the disposal of banned pesticides
- Administers pesticide testing to determine adverse effects on humans, wildlife, fish, and plants
- Registers pesticides and often restricts certain uses
- Develops integrated pest management programs
- Regulates pesticidal contamination of drinking water

3.1.1.10.6 National Environmental Policy Act of 1969 (NEPA):

- Requires an Environmental Impact Statement (EIS) to be completed for any proposed legislation and/or activity that could alter the quality of the human environment
- Mandates that alternatives to minimize potential impacts be considered, and possibly adopted

3.1.1.10.7 Pollution Prevention Act of 1990 (PPA):

- Proposes voluntary compliance in toxics reduction
- Recommends increased efficiencies in the use of energy, water, raw materials, and other resources through conservation efforts

3.1.1.10.8 Resource Conservation and Recovery Act of 1976 (RCRA):

- Requires the EPA to regulate the treatment, storage, disposal, and transportation of hazardous and solid waste in the U.S.

3.1.1.10.9 Toxic Substances Control Act of 1976 (TSCA):

- Authorizes EPA to regulate chemical substances that present a serious human health risk or potential harm to the natural environment
- Requires EPA to investigate chemical substances that pose imminent hazards

3.1.1.10.10 Marine Protection, Research and Sanctuaries Act (MPRSA):

- Regulates the dumping of industrial waste or sewage sludge into the ocean

3.1.1.10.11 National Environmental Education Act of 1990 (NEEA):

- Develops environmental education and training materials in order to increase public knowledge of the natural environment

3.1.1.10.12 Protection of Wetlands-Executive Order 11990:

- Regulates new construction in wetlands by requiring actions to be taken that will preserve the natural values and minimize destruction and modification of these delicate areas

3.1.1.10.13 Water Management Programs:

Administer programs in the areas of:

- Coastal and Ocean Protection
- Ecosystem Protection
- Effluent Trading
- Fish Consumption Advisories
- National Estuary Program
- Nonpoint Source Pollution Control
- Point Source Control
- Water Quality Standards, Criteria, and Methods
- Wetlands/Aquatic Resources Protection
- Watershed Approach

3.1.2 *State of Oregon Government Agencies*

3.1.2.1 Oregon Department of Agriculture

The Oregon Department of Agriculture provides service, leadership, and regulatory functions for the agricultural industry. It regulates commercial shellfish areas, administers the pesticide control program, and assists with implementing programs that address agriculturally related non-point source pollution impacts on water quality. The Department is divided into eight major program divisions. One division that is of particular importance to the mainstem Lower Columbia River and estuary is the Natural Resources Division. This division develops agricultural water quality management plans, and provides support to 45 Soil and Water Conservation Districts throughout the state. The other significant division is the Food Safety Division, which is responsible for shellfish safety.

3.1.2.1.1 Conservation Projects:

- Coordinates programs for the conservation districts

- Provides administrative grant assistance to districts
- Reviews all projects, practices, budgets, contracts, or regulations of districts

3.1.2.1.2 Ocean Resources:

- Administers the commercial oyster plat leasing program
- Administers the state's shellfish sanitation program

3.1.2.1.3 Water Planning Coordination:

- Coordinates basin program development with local Soil and Water Conservation Districts

3.1.2.1.4 Water Quality:

- Provides assistance to farmers through Soil and Water Conservation Districts on ways to protect water quality
- Works with Oregon's Department of Environmental Quality on agriculturally related non-point source pollution programs
- Administers Senate Bill 1010 in assisting producers in addressing those agricultural activities in watersheds known to have the most problems with water quality, to prevent pollution problems where possible, and to manage existing problems

3.1.2.1.5 Watershed and Riparian Management:

- Provides technical assistance to the Governor's Watershed Enhancement Board
- Provides funding for landowner workshops on watershed issues

3.1.2.2 Oregon Department of Environmental Quality

The mission of Oregon's Department of Environmental Quality (DEQ) is to be an active force torestore, enhance, and maintain the quality of Oregon's air, water, and land. DEQ is a regulatory agency that strives to protect the state's environment. Specific to water quality, the agencypreserves and restores Oregon's waters to ensure that they are drinkable, swimmable, and fishable. It also regulates discharge permits and investigates stormwater runoff pollution in order to maintain clean water. Many of the agency's programs are relevant to the management of the Lower Columbia River Estuary:

3.1.2.2.1 Coastal Non-point Control Program:

- Exercises joint responsibility with Oregon Department of Land Conservation and Development to implement coastal non-point program
- Develops and implements non-point source pollution programs needed for comprehensive program approval: Construction Site Erosion Control Program, Sewage Disposal Systems Inspection and Education Program, and Road and Bridge Construction and Maintenance Program

3.1.2.2.2 Dams, Reservoirs, and Hydroelectric Power Activities:

- Analyzes requests for 401 certificates associated with FERC applications
- Issues certificates when appropriate
- Reviews proposals for dredge and fill activities and hydroelectric water storage to assure water quality standards are met

3.1.2.2.3 Ocean Resources:

- Participates in the development of an ocean policy and maintenance of the Territorial Sea Management Plan

3.1.2.2.4 Permit Responsibilities:

- Issues National Pollution Discharge Elimination System (NPDES) and Waste Pollution Control Facility permits
- Inspects permitted facilities to affirm compliance and enforces actions needed against non-compliant facilities

3.1.2.2.5 Wastewater Activities:

- Develops pretreatment requirements to be met by municipal sewerage facilities
- Insures the safe disposal of wastewater treatment plant sludge
- Regulates the siting, installation, and operation of on-site sewage disposal systems
- Certifies the qualifications of operators of wastewater treatment plants

3.1.2.2.6 Water Planning Coordination:

- Ensures rules and actions are consistent with local comprehensive land use plans
- Coordinates program development activities with other state natural resource management agencies

3.1.2.2.7 Water Quality:

- Monitors and analyzes the quality of the state's surface and groundwater
- Reviews and establishes water quality standards for the state
- Establishes total daily maximum loads for streams that are not in compliance with water quality standards
- Develops individual control strategies for non-complaint water bodies
- Reviews and approves plans for pollution control facilities

3.1.2.2.8 Wetlands Management:

- Reviews 404 dredge and fill applications for wetland activities
- Determines if wetland activities will ensure water quality standards are met pursuant to Section 401 of the Clean Water Act
- Maintains an inventory of coastal wetlands in Oregon

3.1.2.3 Oregon Department of Fish And Wildlife

Oregon's Fish and Wildlife Department aims to protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations. The agency attempts to accomplish this mission by conducting research on fish and wildlife issues, and making recommendations to other state and federal agencies with regulatory authority. The department is divided into several divisions. The most important to LCREP are the Fish Division, Habitat Conservation Division, Wildlife Division, and the Information and Education Section. The following activities are of interest to the mainstem lower Columbia River and estuary:

3.1.2.3.1 Dams, Reservoirs, and Hydroelectric Power Activities:

- Evaluates Water Resources Department and Division of State Lands permit applications and recommends conditions for fish passage, fish screening, and mitigation of adverse impacts on habitat
- Reviews hydroelectric project applications and offers recommendations regarding fish and wildlife resources

3.1.2.3.2 Fish and Wildlife Programs:

- Implements Salmon and Trout Enhancement Program
- Operates 34 fish hatcheries and 15 satellite rearing facilities
- Performs freshwater production studies
- Prepares Fish Management Subbasin Plan
- Inventories fish populations, production, and harvest and monitors factors affecting populations
- Develops habitat improvement projects with other federal agencies
- Reviews federal, state, and local governments' activities for potential impact on fish and wildlife

3.1.2.3.3 Ocean Resources:

- Manages ocean and intertidal fisheries and marine wildlife resources
- Participates in the Ocean Management Task Force
- Reviews ocean and near-shore permit applications

3.1.2.3.4 Water Quality:

- Assists DEQ with identifying and providing for fish and wildlife water quality needs
- Develops policies and procedures for investigation of and compensation for toxic spills in waterways

3.1.2.3.5 Watershed and Riparian Management:

- Reviews federal land management plans and programs
- Works with landowners to develop riparian management projects
- Recommends permit conditions for forest and riparian zone projects affecting fish resources

3.1.2.3.6 Wetlands Management:

- Reviews fill and removal permits
- Examines the implementation of the Wetland Mitigation Bank Program, the Wetland Priority Plan, and Wetland Conservation Plans

3.1.2.4 Oregon Department of Forestry

The Department of Forestry strives to serve the people of Oregon through the protection, management, and promotion of a healthy forest environment which will enhance Oregon's livability and economy for today and tomorrow. The Department has three areas of concentration that are important to the Lower Columbia River Estuary: forest practices, forest assistance, and

protection from fire. Through these three programs, the agency maintains forest productivity, water quality, and fish and wildlife habitat.

3.1.2.4.1 Dams, Reservoirs, and Hydroelectric Power:

- Examines impacts of hydroelectric development on the commercial forest land base
- offers recommendations to decision makers regarding findings

3.1.2.4.2 Forest Assistance Program:

- Provides technical and financial assistance to help perpetuate Oregon's forest resources
- Promotes forest health
- Enhances and protects critical natural resource values on non-federal forest land

3.1.2.4.3 Forest Practices Program

- Administers the Oregon Forest Practices Act
- Works to assure that the continuous growing and harvesting of forest tree species and maintenance of forest land for forest purposes are the primary uses of privately owned forest lands
- Assures that forest practices are consistent with sound management of soil, air, water, fish, and wildlife resources
- Threatened and Endangered Species:
- Inventories resource sites used by threatened and endangered species in Oregon
- Determines protection requirements needed during forest operations
- Administers watershed-specific practices for threatened and endangered species on forest lands
- Inventories resource sites on forest lands in the state that affect bird species using sensitive nesting, roosting, and watering sites
- Determines protection requirements needed during forest operations for such birds

3.1.2.4.4 Water Quality:

- Regulates forest timber management practices according to Forest Practices Rules in order to protect water quality
- Administers watershed-specific practices on forest lands for water quality limited watersheds
- Protects water quality during mixing and application of chemicals on forest lands

3.1.2.4.5 Watershed and Riparian Management:

- Manages state forest lands
- Reviews and comments on federal land management plans and programs
- Provides advice to landowners regarding management of forest resources
- offers assistance to the Governor's Watershed Enhancement Board
- Establishes riparian management areas along streams, lakes, and wetlands on forest lands

3.1.2.4.6 Wetlands Management:

- Inventories significant wetlands in the state's forest lands

- Determines what wetland protection is needed during forest operations

3.1.2.5 Oregon Department of Human Resources: Oregon Health Division

The Oregon Health Division is a program within the Oregon Department of Human Resources. The Health Division's mission is to preserve, protect, and promote the health of all Oregonians.Specific to water quality and fish contamination, the Division is responsible for the protection of drinking water supplies and investigation of public health hazards.

3.1.2.5.1 Water Quality:

- Responds to public health complaints related to water contamination
- Watershed and Riparian Management:
- Identifies watersheds used for drinking water supplies for interagency protection
- Provides training to water purveyors on watershed management issues

3.1.2.5.2 Water Planning Coordination:

- Coordinates development of plans for water systems and wellhead protection
- Issues health warnings regarding fish and seafood consumption

3.1.2.6 Oregon Department of Land Conservation And Development

The main purpose of the Department of Land Conservation and Development (DLCD) is to improve Oregon's quality of life through sound land use planning. In keeping with its mission, DLCD is responsible for monitoring and implementing the State of Oregon's Land Use Planning Program. The primary implementers of Oregon's land use program are local governments – cities and counties. All the cities and counties in the state have adopted comprehensive plans to comply with Oregon's 19 Statewide Planning Goals. The Land Conservation and Development Commission (LCDC) is responsible for developing the Statewide Planning Goals and for promulgating rules and guidelines for their implementation. The Department monitors the adoption, implementation, and amendment of local plans to ensure their continued compliance with the Statewide Planning Goals. The Department also administers the Oregon Coastal Management Program, a federally funded program for the use and conservation of valuable coastal resources. The agency's responsibilities include:

3.1.2.6.1 Land Use Planning

- Adopts administrative rules and implementation guidelines for Statewide Planning Goals
- Coordinates state and federal programs that affect land use
- Monitors local plan implementation and amendments to assure their continued compliance with the Statewide Planning Goals
- Provides technical assistance to local governments on comprehensive planning issues
- Administers grants to cities and counties for comprehensive planning assistance
- Certifies the programs of state agencies for coordination on resource issues and matters affecting land use planning, including water resources planning and development

3.1.2.6.2 Ocean and Coastal Resources:

- Administers a federal grant under section 306 of the Coastal Zone Management Act for coastal resource management

- Reviews federal activities affecting the coastal zone to assure their consistency with the policies of the Oregon Coastal Management Program
- Manages the Oregon Ocean Policy Advisory Council

3.1.2.6.3 Water Quality and Aquatic Habitat:

- Reviews and comments on state and federal permits for coastal projects
- Implements the Coastal Nonpoint Source Pollution Control Program under section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990
- Provides comments where appropriate on state and federal agency permit applications for in-water activities and alterations

3.1.2.7 Oregon Department of Transportation

The mission of the Oregon Department of Transportation (ODOT) is to provide an efficient, safe transportation system that enhances Oregon's competitiveness and livability. ODOT is committed to the protection and preservation of Oregon's unique environment, and employs a group of scientists, engineers, historians, archaeologists, and environmental project managers to study and mitigate the effects of transportation projects on a wide variety of natural and cultural resources. The Environmental Services Section is responsible for coordinating environmental regulatory compliance for all transportation improvement programs in the state which use federal funds. The Environmental Resources Section is broken down into a Wetlands and Water Quality Team, Biological Resources Team, and Cultural Resources Team.

3.1.2.7.1 Biology Team Activities:

- Conducts programmatic biological assessments within watersheds
- Conducts biological evaluations for impacts on sensitive species for projects on BLM or Forest Service lands
- Ensures that department activities do not negatively impact state-listed plant species
- Conducts necessary environmental impact statements for department activities which address fish and wildlife concerns
- Administers corridor studies to identify biological resources in development areas (done by Planning Section)

3.1.2.7.2 Water Quality Activities:

- Extends the requirements of NPDES stormwater permits to every project administered by ODOT
- Develops erosion and sediment control programs for construction sites
- Wetland Mitigation and Monitoring Program:
- Ensures that proposed wetland permits analyze water impacts and conceptual mitigation activities
- Provides studies on possible impacts of transportation projects on endangered and threatened species in wetland environments
- Monitors wetland mitigation sites for 5 years, often longer if deemed necessary

3.1.2.8 Oregon Division of State Lands

The Division of State Lands (DSL) acts for the state as owners and stewards of the submerged and submersible lands of all publicly owned navigable streams and lakes in Oregon. DSL has permit authority for fill and removal of 50 cubic yards or more of material in all waterways and wetlands, and coordinates the state resource agency's review of the Army Corps of Engineers permit applications for any alteration or construction activities in navigable waters. The agency also administers programs in the following areas:

3.1.2.8.1 Ocean Resources:

- Manages geological and geophysical exploration survey permitting program
- Develops and manages the hard minerals exploration program for management of submerged and submersible lands of the state territorial sea

- Participates with Ocean Resources Management Task Force in developing Ocean Resources Management Plan

3.1.2.8.2 Water Planning Coordination:

- Provides technical assistance to local units of government on development proposals affecting "waters of the state" (e.g. wetland inventories, wetland conservation plans, waterway development management plans)

3.1.2.8.3 Watershed and Riparian Management:

- Manages state-owned range and forest lands and navigable waters (e.g. leases, easements, etc.)

3.1.2.8.4 Wetlands Management:

- Prohibits fill and removal activities in significant wetlands, major marshes, or other waters of the state designated for protection under state land use goals 5, 15, 16, 17
- Permits and administers the removal of material from the beds and banks or filling of the waters of the state under ORS 196.800 to 196.990
- Administers the Wetlands Mitigation Bank
- Prepares a Wetland Priority Plan for acquisition in consultation with other state and federal agencies

3.1.2.9 Oregon Governor's Watershed Enhancement Board

The Governor's Watershed Enhancement Board was created by the 1987 Legislature for the purpose of providing assistance to land owners and managers to undertake activities which would enhance the ability of their watershed to function and produce greater water quality and quantity. The Board comprise representatives from five of the state natural resource boards and commissions (Oregon Fish and Wildlife Commission, Board of Forestry, Oregon Soil and Water Conservation Commission, Water Resources Commission and the Environmental Quality Commission). The board is chaired by the Governor's Natural Resource Advisor and has non-voting members from the U.S. Forest Service, Bureau of Land Management, Oregon Department of Agriculture, Oregon State University Extension Service, and Natural Resources Conservation Service. The Board's two standing advisory committees, the Technical and Education Advisory Committees, comprise state and federal resource agency representatives.

- GWEB provides grant funds for watershed restoration, education, watershed council coordinators, and conducting watershed assessments/action plans and monitoring. GWEB provides funding statewide through a grant application, review and award process.
- In 1995, through the passage of House Bill 3441, GWEB received the additional responsibility of supporting watershed councils. Watershed councils are local, volunteer, broad-based citizen groups recognized at the local government level for the purpose of identifying and coordinating local watershed protection and enhancement. There are nearly 50 locally recognized watershed councils across the state. GWEB is also integrally involved in Oregon's Coastal Salmon Restoration Initiative and the Healthy Streams Partnership. The program supports, through grants, local efforts to restore fish and wildlife habitat and improve water quality.

3.1.2.10 Oregon Marine Board

The Marine Board is Oregon's recreational boating agency. The agency registers and titles motorboats, sailboats over 12 feet in length, floating boats, boat houses, and houseboats. Ocean charterboats are licensed by the Board, and guides and outfitters operating in the state must be registered with the Board. The Board sets equipment and operating requirements for recreational watercraft and enforces boating laws on boundary waters. The Marine Board is administered by a five-member citizen board appointed by the governor. The following are some other areas of interest to the mainstem Lower Columbia River and estuary study area:

3.1.2.10.1 Water Planning Coordination:

- Develops and implements Oregon Boating Facilities Plan
- Provides statewide funding for the coordination of boating law enforcement
- Provides funds to local and state agencies, including port and park districts, to allow boating access and support for facilities
- Administers federal Clean Vessel Act funds

3.1.2.10.2 Water Quality:

- Funds pumping stations for recreational boat holding tanks that control water pollution
- Adopts rules regarding marine toilets, restricting motor use on boating waters of the state, and regarding equipment on boats
- Reviews plans and designs of funded facilities for potential water quality impacts
- Issues permits for polystyrene foam flotations

3.1.2.11 Oregon office of Energy

The purpose of the Oregon office of Energy is to ensure that Oregon's energy future is built on a least-cost mix of conservation, renewable, and conventional energy resources and to clean up nuclear waste. The Energy Resource Division serves as staff to the Energy Facility Siting Council (EFSC), reviewing applications for large energy facilities. The office carries out radioactive waste cleanup and radioactive materials transport responsibilities of the Siting Council as well. Oversight of the Hanford (Washington State) cleanup effort is the responsibility of the Nuclear Safety Division. In order to achieve the State's energy goals, the office of Energy creates energy plans and policies to guide state agency programs. In the area of water management, this agency conducts activities in the following areas:

3.1.2.11.1 Energy Facilities:

- Is responsible for power plants (excluding hydroelectric) greater than 25 MW, large transmission lines and natural gas pipelines, and large natural gas storage and fuel production facilities
- Decides all conditions related to a proposed energy facility, including fish and wildlife habitat issues
- Reviews application documents and makes recommendations to EFSC
- Responsible for ongoing oversight of approved facilities

3.1.2.11.2 Ocean Resources:

- Governs off-shore energy facilities, but extent is not clear

3.1.2.12 Oregon Parks and Recreation Department

The Parks and Recreation Department strives to provide and protect outstanding natural, scenic, cultural, historic, and recreational sites for the enjoyment and education of present and future generations. The agency is responsible for purchasing, developing, and managing state parks. It also provides areas for recreation, as well as research and preservation of historic sites and unique natural areas.

3.1.2.12.1 Dams, Reservoirs and Hydroelectric Power:

- Evaluates recreation benefits and other impacts resulting from proposed publicprojects
- Reviews storage and hydroelectric project applications to assure that recreational, historical, archaeological, and visual quality standards are addressed
- Assures that projects are compatible with the State Scenic Waterway and Willamette River Greenway programs

3.1.2.12.2 Ocean Shores Program:

- Conducts improvements west of the vegetation line
- Regulates pipelines, cables, conduits, and removal of natural products
- Protects access to public beaches
- Regulates vehicular traffic on beach

3.1.2.12.3 Scenic Waterways Program:

- Encourages new development that blends in with the natural landscape
- Classifies each designated waterway into six categories which govern the amount and type of development allowed
- Sets performance and design standards

3.1.2.12.4 Water Planning Coordination:

- Administers state Scenic Waterway System
- Reviews all federal actions for compliance with National Historic Preservation Act

3.1.2.12.5 Administers Willamette River Greenway program

- Develops State Park Master Plans

3.1.2.12.6 Watershed and Riparian Management:

- Reviews local and state planning actions affecting the Willamette River Greenway, scenic waterways, ocean shores, recreational trails, and state-owned parks
- Produces statewide comprehensive outdoor plans
- Awards federal and state grants-in-aid

3.1.2.12.7 Wetlands Management:

- Incorporates wetlands priority plan as part of the State Comprehensive Outdoor Recreation Plan (SCORP)

3.1.2.12.8 Willamette River Greenway Program:

- Coordinates the Greenway Plan, which describes the greenway boundaries, scenic easements, and known subsurface mineral and aggregate deposits
- Acquires land along the Willamette River for recreation, scenic, and fish and wildlife purposes

3.1.2.13 Oregon Water Resources Department

The mission of the Water Resources Division is to serve the public by practicing and promoting wise long-term water management. Its primary work that is of interest to the LCREP involves protecting and restoring streamflows and watersheds, safety of dam construction activities, and appropriation of water rights.

3.1.2.13.1 Dams, Reservoirs, and Hydroelectric Power:

- Evaluates and issues permits for construction of reservoirs, storage of water, and use of stored water
- Monitors safety of existing dams
- Analyzes water permit and license applications for hydroelectric project development
- Prepares recommendations for Water Resources Commission
- Designates beneficial uses of water
- Coordinates state input on the operation of federal multiple-purpose reservoirs

3.1.2.13.2 Water Planning Coordination:

- Adopts and maintains the Oregon Water Management Program, including statewide water policies and basin programs
- Assists local governments in local water planning activities
- Issues and regulates water rights

3.1.2.13.3 Water Quality:

- Enforces instream water rights necessary for pollution abatement to sustain fish life and support recreation
- Maintains well construction and abandonment rules
- Adopts and enforces rules for monitoring wells and other artificial openings

3.1.2.13.4 Watershed and Riparian Management:

- Identifies potential watershed and riparian zone enhancement projects
- Administers and provides assistance to the Governor's Watershed Enhancement Board
- Provides loan funds for watershed improvement projects
- Reviews federal land management plans and programs for watershed and riparian area management practices

3.1.2.13.5 Wetland Management:

- Clarifies water use permitting requirements for constructed or enhanced wetlands and "disturbed sites"

3.1.3 *State of Washington Government Agencies*

3.1.3.1 Washington Conservation Commission

The mission of the Washington State Conservation Commission is to protect, conserve, and enhance the natural resources of this state through the practice of conservation and stewardship. The Commission provides leadership to, and represents, 48 of Washington's locally governed conservation districts. The Commission encourages the cooperation and collaboration of the federal, state, regional, interstate, and local public agencies which assist the conservation districts. The Commission is made up of three individuals elected by conservation district supervisors, the president of WACD, two individuals appointed by the Governor, and representatives of four state agencies.

3.1.3.1.1 Conservation Projects:

- Administers grants to conservation districts for conservation projects
- Formalizes and administers memos of understanding with other state and federal natural resource agencies to synchronize their missions, goals, and objectives

3.1.3.1.2 Habitat Conservation Measures:

- Works through the Conservation District Network to coordinate model salmon habitat improvement projects
- Acts as lead state agency in coordinating salmon recovery efforts with Idaho, Oregon, and Montana
- Leads a committee in establishing standards for improving fish and wildlife habitat on agricultural and grazing land managed by state agencies

3.1.3.1.3 Water Management:

- Administers direct technical assistance to dairy operators to reduce non-point source pollution caused by manure

3.1.3.2 Washington Department of Agriculture

This state department is responsible for assisting agricultural producers in Washington to ensure that the marketing, grading, and standardizing of commodities are carried out in a fair andefficient manner without unnecessary restraints. The Department is divided into eight divisions. The two divisions that are relevant to the mainstem lower Clumbia River and estuary study area are:

3.1.3.2.1 Food Safety and Animal Health Division:

- Licenses and inspects dairy farms and food processing plants
- Certifies organic food production
- Administers animal health programs
- Pesticide Management Division:
- Registers products for sale
- Licenses applicators to use pesticides
- Addresses groundwater protection and farm worker safety

3.1.3.3 Washington Department of Community, Trade, And Economic Development

The Washington Department of Community, Trade, and Economic Development (CTED) works to build and sustain strong social, environmental, and economic foundations for Washington State. Effective July 1, 1996, the energy policy functions formerly performed by the Washington State Energy office, along with the responsibilities of the Energy Facility Site Evaluation Council, were transferred to the newly created Energy Service Area of CTED. The 1995 Legislature also established the Land Use Study Commission, with the overall goal of integrating Washington's land use and environmental laws into a single, manageable statute. CTED's other program significant to the mainstem lower Clumbia River and estuary study area is the Growth Management Program, which helps communities plan for growth and development in a way that is consistent with the state's Growth Management Act (GMA).

3.1.3.3.1 Energy Service Area (houses the following two programs):

.3.1.3.3.1.1 The Washington Energy Policy Group:

- Provides the Governor, legislature, and other state and local governments with information, analysis, and expert testimony to facilitate the inclusion of public interest criteria into state, regional, and national energy policy.
- Develops, collects, and analyzes data on energy resources
- Develops and represents the state's energy interests in external policy forums

.3.1.3.3.1.2 The Energy Facility Site Evaluation Council:

- Sites major energy facilities
- Protects the environment and safety interests in regard to the energy facilities 2) Land Use Study Commission:
- Reviews the effectiveness of existing land use and environmental laws
- Identifies revisions needed in the laws to adequately plan for growth and to achieve
- economic and environmentally sustainable development

3.1.3.3.2 Growth Management Program:

- Coordinates state agency actions and policies related to managing growth
- Provides training and technical assistance to counties and cities planning under GMA
- Delivers financial assistance to counties and cities to assist in GMA responsibilities
- Coordinates the adoption of rules guiding development and adoption of comprehensive plans and development regulations
- Provides state review and comment on county and city comprehensive plans and development regulations implementing GMA
- Represents CTED in development of state water policy

3.1.3.4 Washington Department of Ecology

The mission of the Department of Ecology is to protect, preserve, and enhance Washington's environment and promote the wise management of our air, land, and water for the benefit of current and future generations. The agency is responsible for water resources, water pollution controls, and shoreline management. It also administers the State Environmental Policy

Act (SEPA) and coordinates environmental permits. of the 11 agency programs, three are relevant to the mainstem lower Clumbia River and estuary study area:

3.1.3.4.1 Environmental Investigations and Lab Services:

- Collects environmental data and analyzes samples
- Provides guidance on maintaining agency data quality
- Conducts technical water quality investigations
- Administers watershed assessments where existing or emerging point source and nonpoint source pollution problems exist
- Conducts studies focusing on the occurrence and significance of toxic metals and organic chemicals in surface waters
- Performs inspections at municipal and industrial wastewater treatment plants to determine compliance
- Provides GIS support to other Ecology departments

3.1.3.4.2 Shorelands and Water Resources Program:

- Administers Coastal Zone grants
- Develops information on water availability in the state's watersheds
- Represents the state in reviewing federal programs related to ocean issues
- Reviews water rights issuance, shoreline permit and SEPA review, proposed Clean Water Act permits that affect wetlands, and shoreline enforcement
- Works to improve public access to shorelines
- Provides technical assistance to local governments on non-regulatory efforts to preserve and restore wetlands

3.1.3.4.3 Water Quality Programs:

- Manages the Coastal Zone Non-point Pollution Prevention Plan
- Coordinates the Permit management process to control the discharge of pollutants from point sources and non-point sources
- Develops and revises water quality standards to identify and protect the designated beneficial uses of the state's surface and groundwater
- Sets water quality criteria to protect the vitality of aquatic plants and animals and the health and safety of Washington's citizens
- Encourages actions that will prevent pollution from being generated
- Promotes a stewardship ethic by informing people how their actions affect water quality and what they can do to be part of the solution
- Maintains integrated information management systems containing environmental and management information
- Provides financial and technical assistance to local governments

3.1.3.5 Washington Department of Fish And Wildlife

The Department of Fish and Wildlife is responsible for the protection, preservation, and perpetuation of Washington's fish resources in waters of the state and offshore waters. The agency also preserves and protects wildlife and game fish resources of the state. The department has five divisions that are particularly relevant to the management of the Lower Columbia River: Fish Management, Habitat Management, Hatcheries, Outreach and Education, and Wildlife Management.

3.1.3.5.1 Fish Management:

- Manages all game fish, food fish, and unclassified aquatic species
- Provides information and expertise on the management of fish and shellfish populations
- Conducts activities through four divisions: - Anadromous Fish Division - Inland Fish Division - Marine Resources Division - Resource Assessment Division

3.1.3.5.2 Habitat Management:

- Preserves, restores, and enhances habitat for fish and wildlife
- Conducts activities through three divisions:
  *Conservation Services
  *Habitat Protection Services
  *Land and Restoration Services

3.1.3.5.3 Hatcheries Program:

- Produces game and food fish for stocking state waters
- Serves as a management tool to increase harvest opportunities for fishers
- Conducts activities through five divisions:
  *Operations Division
  *Assessment and Development Division
  *Columbia River Coordination Division
  *Facility Support Division
  *Fish Health Division

3.1.3.5.4 Outreach and Education Program:

- Focuses on public outreach and extension services
- Promotes volunteerism to benefit fish and wildlife

3.1.3.5.5 Wildlife Management Program

- Manages over 640 species of vertebrates and thousands of species of invertebrates
- Manages wildlife populations and their habitats, while promoting recreational opportunities
- Conducts activities through four divisions:
  *Game Division
  *Wildlife Diversity Division
  *Wildlife Resource Data Systems Division
  *Wildlife Research Division

3.1.3.6 Washington Department of Health

The mission of the Department of Health (DOH) is to empower individuals and communities to make informed health choices; to assure access to quality prevention and illness care; to protect people from environmental threats to health; and to advocate sound cost-effective health policies. This Department is Washington State's health agency with responsibility for all environmental health issues. The Department of Health has five divisions; the Environmental Health Division is the most significant to the mainstem lower Clumbia River and estuary study area. This Division helps carry out the core functions of public health: health assessment, policy development, prevention, and quality assurance to protect people from chemical, physical, and biological hazards in the environment.

3.1.3.6.1 office of Shellfish Programs

- Licenses and certifies commercial shellfish operations
- Implements Puget Sound Water Quality Authority tasks associated with shellfish

3.1.3.6.2 office of Toxic Substances

- Investigates alleged, suspected, or potential exposures to toxic substances
- Assesses health hazards and exposure pathways
- Provides health education on prevention and action strategies

3.1.3.7 Washington Department of Natural Resources

The Department of Natural Resources (DNR) manages more than 5 million acres of state-owned lands, including Natural Area Preserves, Natural Resources Conservation Areas, state trust lands, state tide and shore lands, harbor areas, and beds of navigable waters, for long-term benefits to public beneficiaries. Washington's aquatic lands are managed as a public trust for the benefit of all current and future citizens, rather than for specific designated beneficiaries. Certain aquatic rights are maintained in trust for the people of Washington, including the public rights of fishing, navigation and commerce. These rights are public ownership interests that apply to all tidelands, shorelands, navigable waters, and underlying bedlands.

The Aquatic Resources Division staff have a broad range of responsibility, including: natural resource trustee, sediment management, land use planning for urban waterfronts and environmentally sensitive areas, managing the geoduck fishery, co-managing shellfish resources with tribes, maintaining public ownership records, and leasing.

The agency also provides wildfire protection, regulates forest practices, and provides scientific information about ecologically sensitive areas and plant species. In particular, DNR provides:

3.1.3.7.1 Financial and Technical Assistance:

- Provides scientific information about geologic hazards and ecologically sensitive areas and plant species
- Provides financial grant assistance to local communities

3.1.3.7.2 Regulatory Activities:

- Protects unimproved private and state-owned lands from wildfire
- Regulates forest practices, surface mine reclamation, and oil, gas and geothermal exploration

3.1.3.8 Washington Department of Transportation

Washington's Department of Transportation (WSDOT) has a Biology Program, Geographic Information System, Hazardous Materials Program, and Water Quality Program, all of which deal in some respects with habitat, water quality, and toxic contaminants. In addition, they are involved in a number of efforts to improve land use, regulatory, and zoning laws. All of the efforts are in place to help the department avoid and/or mitigate impacts resulting from transportation projects, while allowing WSDOT to conduct its core business of constructing and maintaining transportation facilities statewide. Summaries of the programs listed above follow:

3.1.3.8.1 Biology Program:

- Surveys project area and assesses impacts on wetland, fish, and wildlife populations
- Develops mitigation plans to compensate for wetland losses
- Monitors mitigation sites for a minimum of five years
- Geographic Information Systems
- Builds and maintains GIS data for a number of relevant resources, including: sensitive groundwater layer, priority habitats and species, wetlands, water resource inventory
- areas, potential hazardous materials sites, stormwater outfalls

3.1.3.8.2 Hazardous Materials Program:

- Assesses possible sources of contamination prior to designing projects
- Determines appropriate methods for containment, cleanup of existing contamination
- Works with other programs and agencies to prevent hazardous materials contamination

3.1.3.8.3 Water Quality Program:

- Administers NPDES municipal stormwater permits for Clark County, including the Lower Columbia Water Quality Management Area
- Inventories stormwater outfalls and investigates stormwater BMP retrofits
- Develops temporary erosion and sediment control plans
- Conducts BMP effectiveness research
- Develops vegetative filter strips to reduce runoff

3.1.3.9 Washington Parks And Recreation Commission

The Washington State Parks and Recreation Commission acquires, operates, enhances, and protects a diverse system of recreational, cultural, historical, and natural sites. The Commission's purpose is to foster outdoor recreation and education statewide to provide enjoyment and enrichment for all. The Commission is charged with protecting, enhancing, and interpreting thenatural history of Washington State.

3.1.3.9.1 Dams, Reservoirs and Hydroelectric Power:

- Evaluates recreation benefits and other impacts resulting from proposed public projects
- Reviews storage and hydroelectric project applications to assure recreational, historical, archaeological, and visual quality standards are addressed through Federal
- Energy Regulatory Commission (FERC) review process
- Seashore Conservation Area (SCA)

- Acquires property to preserve the natural state of the ocean beaches
- Protects access to public beaches
- Regulates vehicular traffic on the beach

3.1.3.9.2 Water Planning Coordination:

- Administers state Scenic Rivers System

3.1.3.9.3 Watershed and Riparian Management:

- Reviews local, state and federal planning actions affecting scenic waterways, ocean beaches, recreational trails, and state-owned parks

3.1.3.9.4 Wetlands Management:

- Provides for the interpretation and preservation of wetlands on lands of the Commission
- Classifies lands for protection and preservation through designations of natural areas and natural area preserves
- Protects targeted sensitive areas threatened by commercial development through acquisition program
- Reviews all internal programs and projects for possible impacts to wetlands and adjusts projects accordingly to achieve no net loss of wetlands

3.1.4 *Regional Agencies: Associations and Councils*

3.1.4.1 Association of Clean Water Agencies

The Oregon Association of Clean Water Agencies (ACWA) is a professional organization comprising 75 agencies and associate members providing wastewater, stormwater, and water quality services to Oregon's urban areas. ACWA utilizes a watershed approach to support water quality management, and address policy and educational issues that face wastewater management. The following is a list of relevant members in the Lower Columbia River vicinity: City of Troutdale, Clackamas County, City of St. Helens, City of Astoria, City of Gresham, City of Portland, and Unified Sewerage Agency. These local governments and other ACWA members carry out the following activities:

3.1.4.1.1 Stormwater Activities:

- Collect and manage stormwater runoff
- Regulate industries to prevent the discharge of toxic substances into waterways
- Water Quality Activities:
- Educate the public about water quality
- Publish brochures for educational purposes
- Adopt and collect fees for municipal water quality services

3.1.4.1.2 Wastewater Activities:

- Provide sewerage collection and treatment
- Provide beneficial uses for reclaimed water, biosolids, and compost

3.1.4.2 Columbia Basin Fish and Wildlife Authority

The Columbia Basin Fish and Wildlife Authority is an association of the Indian tribes and agencies charged with managing fish and wildlife resources throughout the Columbia River Basin. The Authority's members include: the twelve treaty tribes in the basin, the National Marine Fisheries Service, the U.S. Fish and Wildife Service, and the state fish and wildlife management agencies of Idaho, Montana, Oregon and Washington. This agency facilitates the needs of resource agencies for joint actions through various committees, work groups and forums. The nonprofit Authority enters into contractual agreements to accomplish the following fish and wildlife goals:

3.1.4.2.1 Fish and Wildlife Activities:

- Facilitates basin-wide goals, plans, work priorities, solutions and policies regarding fish and wildlife issues
- Presents consensus member positions regarding fish and wildlife issues at relevant meetings
- Mediates disputes between member organizations, on request
- Provides expertise to award and monitor contracts on fish and wildlife investigations and mitigation measures

3.1.4.2.2 Plans Developed:

- Developed Subbasin Plans for the 31 major drainages in the Columbia Basin, under contract with the Northwest Power Planning Council
- Developed an Integrated System Plan which proposes strategies for salmon and steelhead production
- Developed many other plans for programs relevant to the Northwest Power Planning Council

3.1.4.3 Columbia River Estuary Study Taskforce

The Columbia River Estuary Study Taskforce (CREST) is a bi-state organization made up of local governments of the Columbia River Estuary. CREST is not a regulatory agency, but is a regional organization that provides a forum for members to identify and discuss issues of regional importance. The initial purpose of this organization was to gather scientific data and produce a management plan for the estuary. This was the first attempt to systematically study the Columbia River Estuary. CREST's members include: Clatsop County, City of Astoria, City of Warrenton, and Port of Astoria in Oregon, and Pacific County, Wahkiakum County, City of Ilwaco, Port of Ilwaco, and Port District No. 2 in Washington. CREST's activities include:

3.1.4.3.1 Environmental Education Activities:

- Develops environmental education programs and activities
- Administers a college-level ecotourism course
- Created a diving tour brochure of the cultural and natural resources of the Columbia River Estuary
- Produced numerous publications on the Columbia River Estuary

3.1.4.3.2 Technical Assistance for Local Governments:

- Assists local jurisdictions with permitting issues, zoning ordinances, comprehensive plans, and Shoreline Master Program amendments

- Assists local governments with issues related to wetlands, Goal 5 inventory and review, and dredging and dredged material disposal
- Developed a GIS natural resource and planning database and hard-copy atlas
- Provides assistance with scientific and environmental projects and issues

3.1.4.4 Cowlitz-Wahkiakum Council of Governments

The Cowlitz-Wahkiakum Council of Governments is a voluntary association of local governments in Cowlitz and Wahkiakum counties, Washington; it also includes the City of Rainier, Oregon. The members consist of municipal and special-purpose governments, along with economic and social service agencies. The purpose of the Council is to provide a forum for its members to work together in a collaborative manner on a wide variety of public, environmental, and economic development issues, as well as to provide local review of state and federal grants. The agency also provides planning and technical services to the local area.

3.1.4.5 Marine Education and Research Training Station

The Marine Education and Research Training Station (MERTS) is an environmental center located in Clatsop County, Oregon. The station, which opened its doors in January 1996, is closely linked with Clatsop Community College's Maritime Sciences Department. The Coastal Studies and Technology Center at Seaside High School, the Oregon Graduate Institute of Science and Technology, and Portland State University are also involved in MERTS by providing environmental research and natural resource programs. MERTS is the logistical and telecommunications hub for research conducted by the Oregon Graduate Institute's Center for Coastal and Land-Margin Research (CCALMR). The activities conducted by CCALMR include studying sediments, materials transport, contamination, and effects of natural and human-made disturbances and tides.

3.1.4.6 Oregon Watershed Improvement Coalition

The Oregon Watershed Improvement Coalition (OWIC) was developed to improve communications among various groups interested in the management of riparian zones in the rangeland environments of Oregon. OWIC is not a public agency; it acts as a consensus-building coalition of interested parties. The goal of the group is to ensure the long-term sustainability of Oregon's watersheds. The objectives of OWIC include:

3.1.4.6.1 Agency Communication:

- Provides a mechanism for landowners, resource managers, and the public to determine achievable objectives for watershed management
- Promotes effective public policy through improved communication
- Conducts an educational program to promote a greater understanding of watershed management

3.1.4.6.2 Watershed Management:

- Promotes the idea that watersheds vary in potential and that solutions must be sitespecific to be effective
- Facilitates the development of management programs to address riparian and upland ecological processes

3.1.4.7 Water Resources Education Center

The Water Resources Education Center, located in Vancouver, WA, was built in association with the wastewater treatment facility. It serves to teach people of all ages to make wise decisions about water. The staff at the education center coordinate school visit programs to educate the students on water use and conservation. The center also offers classes for children and adults on exploring water education through art and using computers to find water-related information. Wetland walks are guided by the center staff.

3.1.5 *Regional Agencies: Quasi-Governmental Organizations and Compacts*

3.1.5.1 Lower Columbia Estuary Partnership (LCREP)

The Lower Columbia River Estuary Partnership is a two-state, public-private initiative. It is implementing a comprehensive management plan for the 146 miles of the lower Columbia River and estuary. It has a strong record of bringing diverse interests together to reach consensus in the best interests of this complex river system. Using a watershed approach, the Estuary Partnership cuts across political boundaries, integrating 28 cities, 9 counties, and the states of Oregon and Washington. LCREP managed the development of a Comprehensive Conservation Management Plan (CCMP), which identifies seven priority issues, based on the detailed technical studies of the Bi-State Program and Estuary Program:

- Biological Integrity
- Impacts of Human Activity and Growth
- Habitat Loss and Modification
- Conventional Pollutants
- Toxic Contaminants
- Institutional Constraints
- Public Awareness and Stewardship

The Management Plan has no regulatory authority, and the Management Plan actions rely on voluntary participation. The plan continues to be supported by a broad stakeholder group now engaged in its implementation.

3.1.5.2 Pacific Fishery Management Council

This council is one of eight in the country created by Congress to make recommendations regarding fishery management. It is a cooperative effort involving federal, state and tribal agencies and the public. The Pacific Council develops management measures for the ocean area out to 200 nautical miles off the coasts of Washington, Oregon, and California. Because of limited funding, councils focus their energies on the major fisheries requiring regional management (salmon, groundfish, and Pacific halibut). The Pacific Council has 13 voting members, which include the principal fishery officials from the states of California, Idaho, Oregon and Washington, the regional director of the National Marine Fisheries Service, and eight appointed citizens. A 14th voting member representing Indian tribes will be added in August 1997.

3.1.5.2.1 Groundfish Plan:

- Provides recommendations to the National Marine Fisheries Service regarding activities that affect groundfish populations and habitat
- Administer activities based on The Pacific Coast Groundfish Fishery Management Plan
- Monitors catch rates throughout the year, recommends annual harvest limits, and analyzes impacts of alternative management measures through the Groundfish Management Team
- Addresses habitat concerns through the Habitat Committee

3.1.5.2.2 Pacific Halibut Plan:

- Allocates the U.S. Pacific halibut quota south of Canada among sport and commercial fishers and treaty Indian tribes
- Forwards recommendations to the International Pacific Halibut Commission and to the National Marine Fisheries Service

3.1.5.2.3 Salmon Plan:

- Provides recommendations to the National Marine Fisheries Service regarding activities that affect salmon populations and habitat
- Administers activities based on the Salmon Fishery Management Plan
- Provides reports which summarize the previous season, estimate abundance for the coming season, and analyze impacts of the Council's proposed and final management recommendations through the Salmon Technical Team
- Addresses habitat concerns through the Habitat Committee

3.1.5.3 Pacific States Marine Fisheries Commission

The Pacific States Marine Fisheries Commission (PSMFC) is one of three interstate commissions dedicated to resolving fishery issues in the states of California, Oregon, Washington, Idaho, and Alaska. The goal of the program is to promote and support policies and actions directed at the conservation, development, and management of Pacific Coast fishery resources of mutual concern to member states through a coordinated regional approach to research, monitoring, and utilization. PSMFC does not have any regulatory authority, but rather provides a forum for discussion and consensus. The agency addresses issues that fall outside of state or regional management council jurisdiction.

3.1.5.3.1 Coordinated Fisheries Information:

- Provides information regarding Pacific Coast fishery resources through the following services:
- Coordinated Information System (CIS)
- Regional Mark Processing System (RMPC) - PIT Tag Information System (PTAGIS)
- Pacific Fisheries Information Network (PacFIN) - Recreational Fisheries Information Network

3.1.5.3.2 F.I.S.H. Habitat Education Project:

- Educates fishers and teachers about the importance of estuaries and bays to marine fish production

- Promotes pollution prevention activities
- For the Sake of the Salmon Program:
- Protects and restores salmon populations by identifying and protecting healthy habitat
- Seeks to improve existing efforts to restore degraded habitats

3.1.5.3.3 Marine Mammal Observer Program:

- Researched the Columbia River, Grays Harbor, and Willapa Bay salmon gillnet fisheries to determine marine mammal mortality associated with fisheries in 1991-1992

3.1.5.4 Northwest Power Planning Council

The Northwest Power Planning Council was established by Congress and the legislatures and governors of Idaho, Montana, Oregon, and Washington through the Northwest Power Act of 1980. The Council is called upon to develop a 20-year electrical power plan, produce a program to protect and rebuild fish and wildlife populations in the Columbia River Basin, and conduct an extensive public involvement program regarding power planning and fish and wildlife protection. The Council is a planning and policy-making body.

3.1.5.4.1 Columbia River Basin Fish and Wildlife Program:

- Addresses the Columbia River and its tributaries as a single system

- Addresses salmon survival at every stage of their life cycle. Activities include:
  *Improvements in spawning habitat
  *Better coordination of hatchery operations
  *Increases in flows and river velocities to speed young salmon past dams -
  *Corrections in the dams to help divert salmon from the turbines
  *Refinements in the use of barges to transport salmon
  *Controls on predators that feed on young salmon - Tighter restrictions on salmon harvests

3.1.5.4.2 Northwest Conservation and Electric Power Plan Activities:

- Developed 1996 Northwest Power Plan
- Implementing 1991 Northwest Power Plan
- Researching alternative resource strategies

3.1.6 *Regional Agencies*

3.1.6.1 Columbia River Gorge Commission

The Columbia River Gorge Commission was established to implement the Columbia River Gorge National Scenic Area Act. The Act directs the Commission to protect and enhance scenic, cultural, natural, and recreational resources, while protecting and supporting the economy of the Columbia River Gorge. The National Scenic Area spans 300,000 acres and includes six counties in Oregon and Washington (Multnomah, Hood River and Wasco in Oregon; Clark, Skamania, and Klickitat in Washington). The Commission has developed its own Management Plan for the Scenic Area, which defines the policies and guidelines for the Scenic Area. The Commission's activities that are relevant to the mainstem lower Columbia River and estuary are:

3.1.6.1.1 Land Use Planning:

- Implements land use ordinances in each of the six counties

- Reviews and approves proposed developments, such as single-family homes, highway construction, etc.
- Investigates and processes violations of development ordinances
- Reviews new land use ordinances for the two counties that have not yet developed their own
- Monitors decisions issued by the counties to ensure compliance with land use ordinances
- offers economic development grants to counties that adopt land use ordinances consistent with the Management Plan

3.1.6.1.2 Monitoring Program of the National Scenic Area:

- Evaluates the effectiveness of the land use policies and guidelines to achieve the objectives of protecting and enhancing the National Scenic Area resources
- Surveys actual projects to determine the cumulative impacts of development on the landscape

3.1.6.2 Columbia River Inter-Tribal Fish Commission

The Columbia River Inter-Tribal Fish Commission was formed in 1977 by resolution of the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation, and the Confederated Tribes and Bands of the Yakama Indian Nation. Under treaties with the United States in 1855, the Commission's member tribes reserved their sovereign rights to hunt and fish in areas ceded to the U.S. and at all usual and accustomed fishing stations. The tribes are recognized as co-managers of the fish resources in the Columbia River Basin.

The Commission is a technical support and coordinating agency for the fisheries management policies of its member tribes. The Commission is governed by the fish and wildlife committees of these tribes. The Commission employs biologists, other scientists, public information specialists, policy analysts, and administrators who work in fisheries harvest control and coordination, scientific support, advocacy, and planning. The Commission also operates a Columbia River fisheries enforcement program for the four tribes. Inter-tribal police officers protect treaty fishermen from harm and harassment and enforce tribal fishing regulations.

3.1.6.3 Metro

Metro was created in 1977 as an elected regional government responsible for addressing issues of metropolitan concern in Oregon. One of its purposes is to protect water quality and floodplains through land use planning activities in the urbanized portions of the three metropolitan counties: Washington, Clackamas, and Multnomah. Oregon land use laws mandate thatMetro manage the urban growth boundary, and Metro's charter mandates that it address water quality, water supply, storage, and fish and wildlife conservation. Water quality is one of the main issues addressed by Metro in its Urban Growth Management Functional Plan that addresses future growth.

Metro has also established a Water Resources Policy Advisory Committee (WRPAC) that advises the Metro Council on technical matters related to all aspects of water resource management. The Committee also advises the Council on watershed issues related to the Region 2040 project and development of the Regional Framework Plan.

Metro's activities include:

3.1.6.3.1 Fish and Wildlife Conservation:

- Establishes regional performance standards for fish and wildlife conservation to conserve, protect, and enhance fish and wildlife habitat within the identified Fish and Wildlife Habitat Conservation Areas, including:
- Prohibiting development in the Fish and Wildlife Conservation Areas that adversely impacts fish and wildlife habitat
- Limiting the clearing or removal of native vegetation from the Fish and Wildlife Conservation Area to ensure its long-term survival and health
- Requiring the revegetation of disturbed areas with native plants to 90 percent cover within three years
- Requiring compliance with ODFW seasonal restrictions for in-stream work
- Coordinates activities that protect fish and wildlife habitat

3.1.6.3.2 Floodplain Management:

- Establishes regional performance standards for floodplain management to protect against flooding and prevent or reduce risk to human life and properties, including:
- Prohibiting development within the water quality and flood management area - Limiting development in a manner that requires balanced cut and fill - Requiring minimum floor elevations to reduce flood damage - Requiring that temporary fills permitted during construction shall be removed

3.1.6.3.3 Water Quality:

- Establishes regional performance standards for water quality to protect and allow for enhancement of water quality associated with beneficial uses, including:
  * Requiring erosion and sediment control for all new development within the Metro boundary
  * Requiring that native vegetation cover be maintained or re-established during development as much as possible
  * Prohibiting new uses of uncontained areas of hazardous materials as defined by DEQ

3.1.6.4 Clean Water Services (Formerly Unified Sewerage Agency)

The mission of the Unified Sewerage Agency (USA) is to protect and conserve the waters of the Tualatin River Basin, providing cost-effective, environmentally sensitive management of wastewater and surface water. USA's geographic area includes 12 cities and the unicorportated areas within the urban growth boundary (including all of Washington and some of Multnomah and Clackamas County's urban growth area). Two of USA's programs are particularly relevant to the mainstem lower Columbia River and estuary:

3.1.6.4.1 Sanitary Program:

- Collects and treats urban wastewater
- Disposes of solids and liquids in a beneficial manner
- Administers pretreatment program for commercial industries that have industrial wastewater by regulating the amount of toxics to be dispersed into relevant waters
- Administers sewer connection permits
- offers consumer education on what materials can safely be put down the drain

- offers “consumer-based monthly service” rates to homeowners, and “strength surcharge” monthly service based on BOD rates for commercial customers; both aimed to reduce usage

3.1.6.4.2 Surface Water Management Program:

- Addresses non-point source pollution via watershed management planning
- Provides pollution prevention education with an intense, focused public involvement program
- Regulates Best Management Practices (BMP’s) design standards
- Regulates on-site stormwater pollution control and erosion control facilities for new developments and administers permits for erosion control
- Administers “River Ranger Program” to educate 4th grade students on water pollution prevention
- Provides technical assistance to citizens interested in stream/wetland enhancement
- Implements regional water quality enhancement projects
- Monitors land use impacts and trends in stream health; includes ambient water quality and biological monitoring

3.1.7 *Oregon Local Government Agencies*

3.1.7.1 Oregon’s Statewide Planning Goals And Guidelines

Oregon has maintained a strong land use planning program for over 25 years. The foundation of the state’s planning program has been in a set of 19 goals and guidelines. These goals are achieved through city and county planning measures described in their individual local comprehensive plans. This program is a partnership between state and local governments. The state provides the standards and oversight, while the local governments administer most of the regulations.

The original enabling legislation passed into law in 1969 required local governments to develop comprehensive plans. The law outlined 10 goals to assist cities and counties in their planning efforts. This program was replaced in 1993 by a more comprehensive one. At that time, the Land Conservation and Development Commission (LCDC) was created and directed to establish new goals and guidelines for statewide planning. After extensive public input and hearings, in 1994 LCDC adopted the current goals 1 through 14. Goals 15-19 were adopted in 1975 and 1976.

3.1.7.1.1 Summary of Oregon Statewide Planning Goals 1-19:

Goal 1: Citizen Involvement

- develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Goal 2: Land Use Planning

- establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Goal 3: Agricultural Lands

- preserve and maintain agricultural lands.

Goal 4: Forest Lands

- conserve forest lands by maintaining the forest land base and to protect the state's forest economy by making possible economically efficient forest practices that assure the continuous growing and harvesting of forest tree species as the leading use on forest land consistent with sound management of soil, air, water, and fish and wildlife resources and to provide for recreational opportunities and agriculture.

Goal 5: Open Spaces, Scenic and Historic Areas, and Natural Resources

- conserve open space and protect natural and scenic resources.

Goal 6: Air, Water and Land Resources Quality

- maintain and improve the quality of the air, water, and land resources of the state.

Goal 7: Areas Subject to Natural Disasters and Hazards

- protect life and property from natural disasters and hazards.

Goal 8: Recreational Needs

- satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational resorts.

Goal 9: Economic Development:

- provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

Goal 10: Housing

- provide for the housing needs of the citizens of the state.

Goal 11: Public Facilities and Services:

- plan and develop a timely, orderly, and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

Goal 12: Transportation:

- provide and encourage a safe, convenient, and economic transportation system.

Goal 13: Energy Conservation:

- conserve energy.

Goal 14: Urbanization:

- provide for an orderly and efficient transition from rural to urban land use.

Goal 15: Willamette River Greenway:

- protect, conserve, enhance, and maintain the natural, scenic, historical, agricultural, economic, and recreational qualities of lands along the Willamette River as the Willamette River Greenway.

Goal 16: Estuarine Resources:

- recognize and protect the unique environmental, economic, and social values of each estuary and associated wetlands; and to protect, maintain, where appropriate develop, and where appropriate restore, the long-term environmental, economic, and social values, diversity, and benefits of Oregon's estuaries.

Goal 17: Coastal Shorelands:

- conserve, protect, where appropriate develop and where appropriate restore, the resources and benefits of all coastal shorelands, recognizing their value for protection and maintenance of water quality, fish and wildlife habitat, water-dependent uses, economic resources, and recreation and aesthetics. The management of these shoreland area shall be compatible with the characteristics of the adjacent coastal waters; and to reduce the hazard to human life and property, and the adverse effects upon water quality and fish and wildlife habitat, resulting from the use and enjoyment of Oregon's coastal shorelands.

Goal 18: Beaches and Dunes

- conserve, protect, where appropriate develop, and where appropriate restore, the resources and benefits of coastal beach and dune areas; and to reduce the hazard to human life and property from natural or man-induced actions associated with these areas.

Goal 19: Ocean Resources

- conserve the long-term values, benefits, and natural resources of the nearshore ocean and the continental shelf. All local, state, and federal plans, policies, projects, and activities which affect the territorial sea shall be developed, managed, and conducted to maintain, and where appropriate enhance and restore, the long-term benefits derived from the nearshore oceanic resources of Oregon. Since renewable ocean resources and uses, such as food production, water quality, navigation, recreation, and aesthetic enjoyment, will provide greater long-term benefits than will nonrenewable resources, such plans and activities shall give clear priority to the proper management and protection of renewable resources.

For the purposes of this inventory, and because of their relevance to the management of the Lower Columbia River, goals 2, 5, 6, 16, 17, 18, and 19 will be discussed in the program summaries for the Oregon city and county governments included in this document.

3.1.7.2 Clackamas County

3.1.7.2.1 Regulatory Activities:

- Surface water management - managing stormwater runoff to improve water quality and minimize flooding
- Issue 1200C Erosion Control Permits
- Wastewater treatment program/facilities

3.1.7.2.2 Non-Regulatory Activities:

- Wetland inventory: evaluate and decide management actions for north urban area of county
- River and Stream Quarter Conservation Area - locate streams and provide protective measures based on size of stream for future development (e.g. setbacks, etc.)
- Sensitive-bird habitat protection activities (e.g. zoning, etc.)
- Best Management Practices (BMP's) to prevent pollution
- Non-point source pollution prevention programs
- Masterplans for surface water and wastewater management

- RiverRangers educational presentations to 3rd and 4th graders
- Technical assistance to communities regarding water quality and flooding issues

3.1.7.2.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning: -

- Zoning and development ordinances

Goal 5: Natural Resources: -

- Identifies wetlands
- Principle River Conservation Area provisions - Historical zoning district overlay - Open space management district - Willamette River Greenway district

Goal 6: Air, Water and Land Resources: -

- Flood management district

3.1.7.3 Clatsop County

3.1.7.3.1 Regulatory Activities:

- Wastewater treatment program/facility
- Solid waste management is handled by the cities
- Stream maintenance and restoration

3.1.7.3.2 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Designation of development area categories

Goal 6: Air, Water and Land Resources:

- Encourage concentration of urban development in the urban growth boundary (UGB)
- Provide an efficient transportation system
- Encourage improvement of pollution control facilities
- Participate in the regional Columbia River planning process
- New subdivisions must have an on-site stormwater management plan

Goal 16: Estuarine Resources: - Maintain a buffer strip of riparian vegetation to preserve water quality

- Dredging and dredged material disposal shall have minimum impacts on the estuary
- Endangered and threatened habitat shall be protected
- Riparian corridor/buffer provisions
- Wetlands protection
- Coastal shorelands protection

3.1.7.4 Columbia County

3.1.7.4.1 Regulatory Activities:

- Stormwater controls program/drains for open ditches
- Most activities for the county are contracted out
- Household hazardous waste program
- Solid waste management
- Mitigation factors for new development

3.1.7.4.2 Non-Regulatory Activities:

- Wetlands inventory

3.1.7.4.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Community development code
- Zoning ordinance
- Sensitive-bird habitat overlay

Goal 5: Natural Resources:

- Identifies water areas and wetlands
- Protects fish and wildlife habitat
- Protects defined Natural Area overlay

Goal 6: Air, Water and Land Resources:

- Monitors non-point source pollution during applicable seasons
- Oil spill prevention
- Identifies industrial waste sources and septic tanks
- Erosion control ordinances
- Adopted well-spacing standards to reduce well-to-well interference

3.1.7.5 Hood River County

3.1.7.5.1 Regulatory Activities:

- Maintains a closed landfill site
- removes and treats materials leaching from the site to protect water quality
- Toxic cleanup activities for landfill

3.1.7.5.2 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning

Goal 5: Natural Resources:

- Identifies conflicting uses in natural area zone
- Historic preservation
- Natural scenic area to regulate development and maintain open space

Goal 6: Air, Water and Land Resources:

- Addresses wetlands, streams, ponds and all other bodies of water
- Identifies wildlife and rare plants
- Provides recreational resources

3.1.7.5.3 National Scenic Area Plan:

- Applies land use guidelines developed by the Columbia River Gorge Commission based on the Management Plan for the Columbia River Gorge National Scenic Area of 1992

3.1.7.6 Multnomah County

3.1.7.6.1 Regulatory Activities:

- Mitigation factors for new development: in the West Hills regarding wildlife habitat,
- streams, significant views, and wetlands
- Wastewater treatment is handled by the City of Portland
- Stormwater controls are handled by Unified Sewerage Agency (USA) in most areas

3.1.7.6.2 Non-Regulatory Activities:

Health Department provides:

- Mosquito-control program using IPM
- Human health assessments of conventional and toxic pollutants in the county
- Consultation for the Columbia Slough area

3.1.7.6.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning and development ordinances
- Zoning ordinance for Multnomah Channel

Goal 5: Natural Resources:

- Significant environmental concern overlay
- Protected aggregate overlay zone
- Historical zoning district overlay
- Willamette River Greenway overlay

Goal 6: Air, Water and Land Resources

- Noise and air pollution reduction
- Grating and erosion control ordinance

3.1.7.6.4 National Scenic Area Plan:

- Adopts land use ordinances based on the Management Plan for the Columbia River Gorge National Scenic Area of 1992

3.1.7.7 Washington County

3.1.7.7.1 Regulatory Activities:

- Wastewater and stormwater are handled by Unified Sewerage Agency (USA) for the urban growth area
- County is responsible for wastewater and stormwater controls in the rural areas caused by development activities
- Mitigation and habitat protection factors for new developments within significant natural resource areas

3.1.7.7.2 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Community development code
- Zoning

Goal 5: Natural Resources:

- Identifies water areas and wetlands
- Identifies wildlife habitat
- Identifies Natural Area for highest level of protection
- Provides floodplain protection

Goal 6: Air, Water and Land Resources:

- Reduced lot sizes
- Noise buffers on certain roads
- Establishes setback requirements for development
- Adopted well-spacing standards to reduce well-to-well interference

3.1.7.8 City of Astoria

3.1.7.8.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Combined sewer overflow studies--To reduce and possibly eliminate combined sewer overflows (CSOs) by designing system improvements
- Household hazardous waste program
- Erosion control activities
- Stormwater control program/drains
- Solid waste management and recycling program
- Mitigation factors for new development
- Toxic clean-up activities
- Habitat protection measures
- Groundwater protection program
- Conventional pollutant monitoring for industry

3.1.7.8.2 Non-Regulatory Activities:

- Watershed planning

- Technical assistance to communities regarding water quality
- River and stream inventory and protection
- No-interest loans for community restoration/improvement
- Household hazardous waste program

3.1.7.8.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning and subdivision ordinance
- Streambank setbacks

Goal 5: Natural Resources:

- Protects open space and scenic views
- Identifies fish and wildlife habitat
- Protects historic properties

Goal 6: Air, Water and Land Resources:

- Maintains and protects water quality in estuarine waters
- Reduces pollution by construction of bypass
- Erosion control measures
- Reduces landslide possibilities related to development
- Maintains steep slopes in natural conditions
- Reduces excavation to minimum

Goal 16: Estuarine Resources:

- Manages groundwater
- Protects streams and estuarine waters
- Identifies and protects wetlands

Goal 17: Coastal Shorelands:

- Promotes uses to maintain integrity of estuary
- Maintains and restores vegetation adjacent to coastal waters
- Provides land for water-dependent/water-related uses

3.1.7.9 City of Cascade Locks

3.1.7.9.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Building a new sewage plant that recycles non-potable water for watering lawns and cooling industrial plants
- Stormwater control program (manages toxic contaminants)
- Floodplain management program

3.1.7.9.2 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning ordinance

Goal 5: Natural Resources

- Open space and scenic area designation
- Wetland conservation

Goal 6: Air, Water and Land Resources:

- Maintains and improves the air, water, and land resources of the state

3.1.7.10 City of Clatskanie

3.1.7.10.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Stormwater control program/drains
- Floodplain management program - protects town and Clatskanie River
- Toxics cleanup program - monitors groundwater for toxic contaminants

3.1.7.10.2 Non-Regulatory Activities:

- Public tours of water treatment plant
- Works with public schools to hire students for positions in Public Works Department through grant program

3.1.7.10.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning and subdivision regulations

Goal 5: Natural Resources:

- Open space and scenic views program
- Identifies fish and wildlife habitat
- Addresses air and water quality, energy and noise sources

Goal 6: Air, Water and Land Resources:

- Identifies watersheds and forestlands

Goal 16: Estuarine Resources:

- Identifies water areas, wetlands, watersheds, fish and wildlife habitat, and groundwater resources

3.1.7.11 City of Columbia City

3.1.7.11.1 Regulatory Activities:

- Wastewater treatment program/facilities: pumped to the City of St. Helens

- Oregon State Health Division Drinking Water Program - Drinking water is purchased from the City of St. Helens

3.1.7.11.2 Non-Regulatory Activities:

- Grant program to provide no-interest loans to low-income families for home weatherization

3.1.7.11.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning ordinance

Goal 5: Natural Resources:

- Overlay zone for McBride Creek
- Fence ordinance in the urban growth area to preserve view

Goal 6: Air, Water and Land Resources:

- Stormwater program with the City of St. Helens
- Subdivider catchbasins for stormwater

3.1.7.12 City of Fairview

3.1.7.12.1 Regulatory Activities:

- Groundwater protection program that addresses toxic contaminants
- Buffer overlays to protect fish and wildlife habitat
- Sewage program is handled by the City of Gresham
- Floodplain ordinance
- Stormwater control program/drains
- Solid waste and recycling program in conjunction with the City of Gresham

3.1.7.12.2 Non-Regulatory Activities:

- Incentive program for developers to dedicate certain areas for open space and public parks

3.1.7.12.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning and subdivision ordinance
- Design review ordinance for new development

Goal 5: Natural Resources:

- Riparian buffer overlay for creeks
- Significant environmental concern overlay--covers wetlands and wooded areas

Goal 6: Air, Water and Land Resources:

- Erosion control ordinance in new construction areas
- Groundwater protection ordinance for new developments

3.1.7.13 City of Gladstone

3.1.7.13.1 Regulatory Activities:

- Wastewater activities are contracted out
- Toxic cleanup activities are contracted out
- Most of the city is fully developed - no need for new ordinances
- Stormwater control program/drains
- Solid waste management and recycling program
- Industrial pre-treatment program via contracts
- Erosion control activities
- Identification of point sources of pollution

3.1.7.13.2 Non-Regulatory Activities:

- Watershed planning
- Wetland, river, and stream inventory
- Stormdrain stenciling program
- Non-point source pollution prevention program
- BMPs to prevent pollution
- Pollution prevention outreach and education activities
- Naturescaping projects
- Mitigation banking for habitat protection
- Household hazardous waste program

3.1.7.13.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Waterfront property is zoned for open space and parks
- Zoning and development codes

Goal 5: Natural Resources:

- Wetland protection

Goal 6: Air, Water and Land Resources:

- Identifies wetlands

3.1.7.14 City of Gresham

3.1.7.14.1 Regulatory Activities:

- NPDES Stormwater Management Program - planning, designing, constructing and maintaining stormwater system
- Protecting and enhancing surface and groundwater
- Solid waste and recycling management
- Wastewater treatment program/facilities

- Industrial pre-treatment program
- Erosion control activities

Non-Regulatory Activities:

- Household hazardous waste program in conjunction with Metro

3.1.7.14.2 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Development code
- Zoning and subdivision ordinance

Goal 5: Natural Resources:

- Physical constraints policy for steep slopes
- Geologic constraints policy
- Soil constraints policy
- Topographical constraints policy
- Hydraulic constraints policy
- Natural resources district buffer to protect waterways

Goal 6: Air, Water and Land Resources:

- Natural resources district
- Open space areas designated
- Fish and wildlife policy

3.1.7.15 City of Hood River

3.1.7.15.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Industrial pre-treatment program
- Erosion control activities

3.1.7.15.2 Non-Regulatory Activities:

- Watershed planning
- Stormwater stenciling program

3.1.7.15.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning and subdivision ordinance

Goal 5: Natural Resources:

- Retention of existing trees and natural topographic features
- Grading and drainage activities shall not negatively impact stormwater drainage

Goal 6: Air, Water and Land Resources:

- Conditional use ordinance and erosion control plan

3.1.7.16 City of Lake Oswego

3.1.7.16.1 Regulatory Activities:

- Prevents toxic contaminants entering surface water
- Developers must provide water quality treatment
- Wastewater collection and treatment

3.1.7.16.2 Non-Regulatory Activities:

- Stream enhancement and restoration
- Stormdrain stenciling program
- Neighborhood grants to restore wetlands and riparian areas

3.1.7.16.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Development and zoning code
- Community design and aesthetics policy

Goal 5: Natural Resources:

- New sensitive lands ordinance to regulate activities in development
- Tree-cutting ordinance
- Open space standards for new developments
- Willamette River Greenway activities

Goal 6: Air, Water and Land Resources:

- Reduces air pollution in metro areas
- Surface water management--ensures protection of natural systems
- Solid waste program to reduce amounts going to landfills
- Stream corridor standard and floodplain ordinance

3.1.7.17 City of Milwaukie

3.1.7.17.1 Regulatory Activities:

- Surface water management plan
- Johnson Creek program - cleanup and manage the amount of sediments accumulated, and protect water quality
- Fish enhancement program - improve fish spawning grounds
- Wastewater treatment program/facilities
- Stormwater control program/drains
- Solid waste management and recycling program
- Toxic clean-up activities contracted out
- Dry well management program
- Wellhead protection program
- Habitat protection measures
- Wetlands restoration contracted out
- Identification of point and non-point pollution sources

3.1.7.17.2 Non-Regulatory Activities:

- Watershed planning
- Stormwater stenciling program
- River and stream inventory and protection
- Water quality studies
- Technical assistance to community regarding water quality
- BMPs to prevent pollution
- Naturescaping projects
- Alternative discharge control programs
- Household hazardous waste program

3.1.7.17.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Development and zoning code

Goal 5: Natural Resources:

- Natural resources overlay - includes habitat restoration activities
- Willamette River Greenway activities that relate to riparian restoration and floodways

Goal 6: Air, Water and Land Resources:

- Protects groundwater from pollution
- Collection and treatment of sewage
- Erosion control ordinance
- Collection of sediments from runoff
- Protection of waterways

3.1.7.18 City of Oregon City

3.1.7.18.1 Regulatory Activities:

- Tri-city service district plan with the Cities of Gladstone and West Linn to provide sewer and stormwater services
- Solid waste management provided by garbage company

3.1.7.18.2 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning code

Goal 5: Natural Resources:

- Water resources ordinance - Historic sites ordinance
- Willamette River Greenway overlay district

Goal 6: Air, Water and Land Resources:

- Erosion control
- Floodplain ordinance

3.1.7.19 City of Portland

3.1.7.19.1 Regulatory Activities:

Bureau of Buildings Activities:

- Erosion control activities

Bureau of Environmental Services Activities:

- Municipal NPDES permits for stormwater control
- Surface water management addressing toxic and conventional pollutants
- Natural resource management plan for watersheds in area - involves habitat protection measures, recreation, and fisheries

- Industrial pre-treatment program
- Residential and commercial recycling

Department of Parks and Recreation Activities:

- Integrated pest management to reduce use of toxic chemicals
- Natural area management plans -- for recreational and water quality purposes

Portland Water Bureau Activities:

- Wellhead protection program

Planning Commission Activities:

- Environmental zone program - to protect environment and minimize
- Native plants program
- Wetlands program

3.1.7.19.2 Non-Regulatory Activities:

Bureau of Environmental Services Activities:

- Combined sewer overflow program - to reduce and possibly eliminate combined sewer overflows (CSOs) by designing system improvements (e.g., downspout disconnection)
- BMPs for industries that are not required to pre-treat waste
- Alternative discharge control mechanisms to meet goals of pre-treatment
- Industry educational programs with updated information
- Stewardship program for watershed areas
- Memorandum of agreement for sediment cleanup in Columbia Slough
- Reduced rates for reduction in trash generation
- Mitigation banking for habitat enhancement
- Naturescaping projects
- Stormdrain stenciling program
- Backyard program that teaches about wildlife and habitat
- Pollution prevention activities

Department of Parks and Recreation Activities:

- BMPs for habitat protection
- Public education on park programs

Planning Commission Activities:

- Native plant handbook

3.1.7.19.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning and subdivision code

Goal 5: Natural Resources:

- Environmental overlays - includes a Conservation Zone and a Protection Zone
- Plan districts
- Natural resource management plan - set-aside areas for specific purposes

Goal 6: Air, Water and Land Resources:

- Environmental zones to protect water quality
- Urban growth boundary designation
- Open space goal

3.1.7.20 City of Rainier

3.1.7.20.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Wetland restoration program
- Stormwater control program/drains
- Erosion control activities
- Industrial pre-treatment program

3.1.7.20.2 Non-Regulatory Activities:

- Stormdrain stenciling program
- Public education on salmon restoration
- Watershed planning
- Wetlands inventory
- Water quality studies

3.1.7.20.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning and development codes

Goal 6: Air, Water and Land Resources:

- Watershed management plan - Timber management plan
- Water and wastewater management regulations

3.1.7.21 City of Scappoose

3.1.7.21.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Potable water program
- Maintain and regulate 3 diversion dams in area - with fish ladders to protect species
- Solid waste management contracted out
- Stormwater control program/drains

3.1.7.21.2 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Development and zoning code

Goal 5: Natural Resources:

- Fish and wildlife overlay zone
- Environmental performance standards
- Local wetland inventory

Goal 6: Air, Water and Land Resources:

- Stormwater drainage master plan
- Wellhead protection plan
- Sensitive lands ordinance
- Floodplain ordinance

3.1.7.22 City of St. Helens

3.1.7.22.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Conventional pollutant tests for Boise Cascade pulp and paper mill
- Pre-treatment program for improving water quality (NPDES)
- Stormwater control program/facilities
- Industrial pre-treatment program
- Zoning and development codes

3.1.7.22.2 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning ordinance

Goal 5: Natural Resources:

- Wetlands inventory
- Scenic views identification
- Riparian habitat area identification

Goal 6: Air, Water and Land Resources:

- Resource conservation program for Sand Island
- Resource management planning
- Flood hazard ordinance
- Steep slope policy

3.1.7.23 City of Troutdale

3.1.7.23.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Stormwater control program/drains
- Erosion control activities
- Habitat protection measures

3.1.7.23.2 Non-Regulatory Activities:

- Pre-treatment program for industry and households
- Stormdrain stenciling program
- Pre-application meetings and site and design review

3.1.7.23.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning ordinance

Goal 5: Natural Resources:

- Open space and scenic areas designation
- Wetland conservation
- Restoration activities for Beaver Creek and the Sandy River

Goal 6: Air, Water and Land Resources:

- Protection of headwater areas
- Flood hazard ordinance

3.1.7.24 City of Warrenton

3.1.7.24.1 Regulatory Activities:

- Stormwater control program/drains
- Wastewater treatment program/facilities
- Solid waste management
- Wetlands restoration
- Skipanon mediated agreement- covers the east bank of the Skipanon and includes a zoning ordinance which provides riparian buffers from rivers and sloughs

3.1.7.24.2 Non-Regulatory Activities:

- Watershed planning council with CREST
- Environmental education presentations
- Mitigation banking and planning

3.1.7.24.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Zoning ordinance
- Comprehensive plan

Goal 5: Natural Resources:

- Wetland conservation plan, and inventory, mitigation, and restoration
- Protection of vegetation along water bodies
- Protection of fish and wildlife habitat

Goal 6: Air, Water and Land Resources:

- Erosion control

Goal 16: Estuarine Resources:

- Regulates development in the Lower Columbia River Estuary
- Diking and dredging regulations

3.1.7.25 City of West Linn

3.1.7.25.1 Regulatory Activities:

- Stormwater control program/drains
- Erosion control activities
- Habitat protection measures

3.1.7.25.2 Non-Regulatory Activities:

- Erosion control training and education

3.1.7.25.3 Local Comprehensive Plan Activities:

Goal 2: Land Use Planning:

- Community development code
- Comprehensive Plan

Goal 5: Natural Resources:

- Willamette River Greenway
- Flood hazard construction
- Tualatin River protection
- Wetland and riparian area protection
- Natural drainageway protection

Goal 6: Air, Water and Land Resources:

- Storm drainage master plan
- Mitigation of soil erosion before and after development
- Minimize introduction of pollutants into ground and surface
- New development must be connected to sewer system

3.1.8 *Washington Local Government Agencies*

3.1.8.1 Washington's Land Use Regulations

In the 1970s, the Washington State Legislature enacted two landmark environmental acts: the State Environmental Policy Act (SEPA) and the Shoreline Management Act (SMA). Twenty years later another significant piece of legislation titled the Growth Management Act (GMA) changed local land use planning and regulation from being optional to being state mandated.

The Shoreline Management Act (SMA), enacted by the state legislature in 1971, is intended to protect valuable shoreline resources, to plan and manage uses, to increase public usage and enjoyment of state shorelines, and to assure public involvement in decisions about shoreline resources. The SMA regulates most shorelines of the state, including marine waters, streams and rivers (with a mean annual flow of 20 cubic feet per second or more), lakes and reservoirs (larger than 20 acres), associated wetlands, and portions of the floodplain.

The Act defines shoreline management as a cooperative effort between the state and local government. Local governments have the primary responsibility for administering and enforcing the SMA through local Shoreline Master Programs (SMPs). The Department of Ecology acts in a supportive capacity and reviews compliance with the SMP and SMA, while assisting local governments. However, the state is authorized to enforce shoreline programs if local government is not taking action.

The Growth Management Act of 1990 establishes the framework for local governments to perform comprehensive planning in order to address growth-related issues. Unlike Oregon's Statewide Planning Goals, most GMA requirements do not apply to all counties and cities in the state. In 1996, two of the five counties in the Lower Columbia River area (Clark and Pacific) are required to plan under the GMA. These requirements apply to counties and their cities that a) have a population of 50,000 or more and a growth rate of 10 percent over the previous 10 years, or b) a growth rate of over 20 percent in the previous 10 years regardless of population. Moreover, counties in the second option are given the opportunity to remove themselves from the requirements within a specified period of time. Other counties not required to comply with GMA requirements were given the option to be governed by the Act. Many unsuccessful proposals have been presented to extend the GMA requirements to all counties and cities. There are several GMA requirements that apply to all counties in Washington State, including non-GMA counties and cities. These include: 1) their development regulations must be consistent with any adopted comprehensive plans; 2) they must designate and protectively regulate critical areas; and 3) they must designate, but need not regulate, natural resource lands. Clark County and Pacific County, along with other GMA counties in Washington, are required to plan under the following 13 statutory goals identified in the state legislation:

Goal 1: Encourage development in areas where adequate public facilities exist or can be provided in an efficient manner

Goal 2: Reduce urban sprawl

Goal 3: Encourage efficient multi-modal transportation systems

Goal 4: Encourage the availability of affordable housing to all economic segments of the population

Goal 5: Encourage economic development throughout the state

Goal 6: Assure private property is not taken for public use without just compensation

Goal 7: Encourage predictable and timely permit processing Goal 8: Maintain and enhance natural resource-based industries

Goal 9: Encourage retention of open space and development of recreational opportunities

Goal 10: Protect the environment and enhance the State's quality of life Goal 11: Encourage the participation of citizens in the planning process

Goal 12: Ensure adequate public facilities and services necessary to support development

Goal 13: Identify and preserve lands and sites of historic and archeological significance

The Department of Ecology is drafting a set of guidelines in 1997 that will discuss how to assure consistent behavior between the GMA and SMA programs, and will add a 14th goal to the GMA which includes a shoreline protection element. The Department of Ecology has established a Shoreline Management Act Regulatory Reform Team (SMAART) to investigate the procedural components to this integration.

3.1.8.2 Clark County

3.1.8.2.1 Regulatory Activities:

- Surface and groundwater management programs
- Stormwater control program/drains
- Dry-well management project
- Wellhead protection program
- Identification of long-range point and non-point sources of water pollution
- Habitat protection activities

3.1.8.2.2 Non-Regulatory Activities:

- "Business Partners for Clean Water Program" --BMPs to prevent pollution
- Pollution prevention outreach and education
- Watershed planning
- BMPs for agricultural activities
- Non-point source pollution prevention program
- RiverRangers educational program

3.1.8.2.3 Critical Areas Ordinance:

- Critical areas ordinance was adopted but is in the process of being revised

3.1.8.2.4 Growth Management Plan:

- Adopted an updated Comprehensive Plan in 1994 with amendments in 1996 - is in compliance with the Washington State Growth Management Act

3.1.8.2.5 National Scenic Area Plan:

- Adopts land use ordinances based on the Management Plan for the Columbia River Gorge National Scenic Area of 1992

3.1.8.2.6 Shoreline Master Plan and Comprehensive Land Use Plan:

- Original Comprehensive Plan was adopted in the 1970s

3.1.8.3 Cowlitz County

3.1.8.3.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Stormwater control program/drains
- Zoning and development codes

3.1.8.3.2 Critical Areas Ordinance:

- Classifies, designates, and protects critical areas
- offers a range of incentives intended to provide protection for critical areas
- Requires the adoption of development regulations to assure conservation
- Critical areas include: wetlands, aquifer recharge areas, geologically hazardous areas, fish and wildlife habitat, and frequently flooded areas

3.1.8.3.3 Growth Management Plan:

- Not applicable to Cowlitz County in 1996

3.1.8.3.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Original shoreline plan developed in 1977 - still utilizing these regulations
- Original comprehensive plan outlining regulations passed in 1976

3.1.8.4 Pacific County

3.1.8.4.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Solid waste management

3.1.8.4.2 Critical Areas Ordinance:

- Being developed in 1997

3.1.8.4.3 Growth Management Plan:

- Required to have one - being developed in the near future

3.1.8.4.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Original shoreline plan developed in the 1970s - still utilizing these regulations
- Comprehensive Land Use Plan being developed in 1997

3.1.8.5 Skamania County

3.1.8.5.1 Regulatory Activities:

- Solid waste management
- No stormwater control program
- Cities handle the wastewater treatment and management

3.1.8.5.2 Non-Regulatory Activities:

- Water quality study in 1996 to address how land use impacts water quality

3.1.8.5.3 Critical Areas Ordinance:

- Developed in 1996 to address the protection of sensitive areas (e.g., buffer zones)

3.1.8.5.4 Growth Management Plan:

- Not applicable to Skamania County in 1996

3.1.8.5.5 National Scenic Area Plan:

- Adopts land use ordinances based on the Management Plan for the Columbia River Gorge National Scenic Area of 1992 - requirements are similar to GMA provisions

3.1.8.5.6 Shoreline Master Plan and Comprehensive Land Use Plan:

- Original shoreline plan developed in 1974 - still utilizing these regulations, but will be updating regulations based on state regulatory reform
- Original comprehensive plan outlining regulations passed in 1977

3.1.8.6 Wahkiakum County

3.1.8.6.1 Regulatory Activities:

- Stormwater control program/drains for Cathlamet ditches
- Solid waste management contracted to Cowlitz County
- Wastewater treatment is not in jurisdiction

3.1.8.6.2 Critical Areas Ordinance:

- Does not have ordinance in 1996

3.1.8.6.3 Growth Management Plan:

- Not applicable to Wahkiakum County in 1996

3.1.8.6.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Original shoreline plan developed in the 1970s - last updated in 1992
- Comprehensive Land Use Plan being developed in the near future

3.1.8.7 City of Camas

3.1.8.7.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Stormwater control program/drains
- Solid waste management plan

3.1.8.7.2 Critical Areas Ordinance:

- Sensitive lands ordinance that addresses fish and wildlife habitat and other critical land areas

3.1.8.7.3 Growth Management Plan:

- Adopted an updated Comprehensive Plan in 1994 - is in compliance with the Washington State Growth Management Act

3.1.8.7.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Original shoreline plan developed in 1971 - implementation is outlined in Zoning Plan

3.1.8.8 City of Cathlamet

3.1.8.8.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Construction requirements for shoreline permits
- Solid waste management is contracted out
- Floodplain ordinance
- Wetlands restoration

3.1.8.8.2 Critical Areas Ordinance:

- Does not have ordinance in 1996

3.1.8.8.3 Growth Management Plan:

- Not applicable to the City of Cathlamet in 1996

3.1.8.8.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Adopted and utilizes Wahkiakum County's land use plans

3.1.8.9 City of Ilwaco

3.1.8.9.1 Regulatory Activities:

- Wastewater treatment program/facilities for Ilwaco and Seaview
- Solid waste management is contracted out
- Stormwater control program/drains outlined in Comprehensive Plan
- Habitat protection measures
- Floodplain ordinance

3.1.8.9.2 Critical Areas Ordinance:

- Adopted "Resource Lands and Critical Areas Designation Policies for City of Ilwaco" in 1993

3.1.8.9.3 Growth Management Plan:

- Adopted the city's Comprehensive Plan in 1995 - is in compliance with the Washington State Growth Management Act

3.1.8.9.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Shoreline Master Plan is incorporated with Pacific County

3.1.8.10 City of Kalama

3.1.8.10.1 Regulatory Activities:

- Pre-treatment ordinance and sewer ordinance - bans toxins going into the sewer
- Erosion control ordinance - relies on BMPs for implementation
- Wetlands protection and restoration

- Subdivision ordinance
- Stream ordinances
- Wastewater treatment program/facilities

3.1.8.10.2 Critical Areas Ordinance:

- Developing a critical areas ordinance in 1997

3.1.8.10.3 Growth Management Plan:

- Not applicable to the City of Kalama in 1996

3.1.8.10.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Adopted Cowlitz County's Shoreline Master Plan
- Adopted Comprehensive Plan in 1994

3.1.8.11 City of Kelso

3.1.8.11.1 Regulatory Activities:

- Stormwater control program/drains - reviews new developments for potential
- Solid waste management is contracted out
- Wastewater treatment program/facilities is handled by the City of Longview
- Floodplain management

3.1.8.11.2 Non-Regulatory Activities:

- Stormdrain stenciling program

3.1.8.11.3 Critical Areas Ordinance:

- Adopted a "Land Clearance Permit" in 1995 with many of the same requirements as a critical areas ordinance - will be updating ordinance in 1997

3.1.8.11.4 Growth Management Plan:

- Not applicable to the City of Kelso in 1996

3.1.8.11.5 Shoreline Master Plan and Comprehensive Land Use Plan:

- Adopted Cowlitz County's Shoreline Master Plan - will be making revisions in 1997
- Original Comprehensive Plan was adopted in 1980 and revised in 1992 - will be undergoing further revisions in 1997

3.1.8.12 City of Longview

3.1.8.12.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Solid waste disposal program
- Environmental review process for new developments

3.1.8.12.2 Non-Regulatory Activities:

- Stormdrain stenciling program

- Household hazardous waste program

3.1.8.12.3 Critical Areas Ordinance:

- Developing a critical areas ordinance in the near future

3.1.8.12.4 Growth Management Plan:

- Not applicable to the City of Longview in 1996

3.1.8.12.5 Shoreline Master Plan and Comprehensive Land Use Plan:

- Adopted Cowlitz County's Shoreline Master Plan
- Original Comprehensive Plan was adopted in 1974 and revised in 1993

3.1.8.13 City of North Bonneville

3.1.8.13.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Solid waste management
- Stormwater control program/drains

3.1.8.13.2 Critical Areas Ordinance:

- Does not have ordinance in 1996

3.1.8.13.3 Growth Management Plan:

- Not applicable to the City of North Bonneville in 1996

3.1.8.13.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Does not have comprehensive plan in 1996
- Adopted Skamania County's Shoreline Master Plan

3.1.8.14 City of Ridgefield

3.1.8.14.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Solid waste management contracted out
- Non-point source pollution system with biofiltration system
- Stormwater control program/drains
- Gee Creek Restoration Plan - restore fish runs and maintain clean water

3.1.8.14.2 Non-Regulatory Activities:

- Stormdrain stenciling program
- Tree-planting program in Gee Creek

3.1.8.14.3 Critical Areas Ordinance:

- Does not have ordinance in 1996

3.1.8.14.4 Growth Management Plan:

- Adopted the city's Comprehensive Plan in 1995 - is in compliance with the Washington State Growth Management Act

3.1.8.14.5 Shoreline Master Plan and Comprehensive Land Use Plan:

- Adopted Shoreline Master Program in 1978

3.1.8.15 City of Stevenson

3.1.8.15.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Stormwater control program drains
- Solid waste management is contracted out

3.1.8.15.2 Critical Areas Ordinance:

- Does not have ordinance in 1996

3.1.8.15.3 Growth Management Plan:

- Not applicable to the City of Stevenson in 1996

3.1.8.15.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Adopted Shoreline Master Program in 1984
- Adopted Comprehensive Plan in 1974 - was revised in 1975

3.1.8.16 City of Vancouver

3.1.8.16.1 Regulatory Activities:

- Groundwater protection program
- Wellhead protection program
- Wastewater treatment program/facilities
- Industrial wastewater pre-treatment program
- Stormwater control program/drains - based on Puget Sound Manual
- Erosion control activities
- Wetland protection ordinance

3.1.8.16.2 Non-Regulatory Activities:

- Established the Water Resources Education Center (described under regional programs)
- Co-developed the Environmental Education Center
- Sewer Connections Incentive Program - elimination of septic tanks
- Annual Water Quality Report - reports data from testing all supply points
- Stormdrain stenciling program
- Mitigation banking for habitat protection: wetlands

3.1.8.16.3 Critical Areas Ordinance:

- Adopted critical areas ordinance in 1993 - underwent revisions in 1996

3.1.8.16.4 Growth Management Plan:

- Adopted the city's Comprehensive Plan in 1995 - is in compliance with the Washington State Growth Management Act

3.1.8.16.5 Shoreline Master Plan and Comprehensive Land Use Plan:

- Original Shoreline Master Plan passed in 1975 - was revised in 1996

3.1.8.17 City of Washougal

3.1.8.17.1 Regulatory Activities:

- Stormwater control program/drains - based on Puget Sound Manual
- Erosion and sediment control activities
- Wastewater treatment program/facilities
- Wellhead protection program
- Wetlands protection ordinance
- Floodplain protection ordinance
- Shoreline development ordinance

3.1.8.17.2 Non-Regulatory Activities:

- Stormdrain stenciling program
- Public education newsletters

3.1.8.17.3 Critical Areas Ordinance:

- Does not have ordinance in 1996

3.1.8.17.4 Growth Management Plan:

- Adopted the city's Comprehensive Plan in 1994 - is in compliance with the Washington State Growth Management Act

3.1.8.17.5 Shoreline Master Plan and Comprehensive Land Use Plan:

- Adopted city's Shoreline Master Plan in 1971 - will be updated in 1997

3.1.8.18 City of Woodland

3.1.8.18.1 Regulatory Activities:

- Wastewater treatment program/facilities
- Stormwater control program/drains
- Solid waste management is contracted out

3.1.8.18.2 Critical Areas Ordinance:

- Adopted critical area ordinance in 1995

3.1.8.18.3 Growth Management Plan:

- Adopted the city's Comprehensive Plan in 1995 - is in compliance with the Washington State Growth Management Act

3.1.8.18.4 Shoreline Master Plan and Comprehensive Land Use Plan:

- Adopted Cowlitz County's Shoreline Master Plan

3.1.9 *Tribal Governments*

Indian tribes represent unique legal entities in the United States, as well as Oregon and Washington, and are distinct political communities. Tribal sovereignty predates the creation of the federal, state or local government. With the creation of these governments, treaties and executive agreements have been established to develop a trust relationship between the tribes and the federal government.

The history of treaty fishing rights along the Columbia River is a complex issue that began many years ago. Currently, the four Columbia River Tribes (the Nez Perce, Umatilla, Warm Springs, and Yakama) are the only tribes in the basin to have reserved rights to anadromous fish that were established in 1855 treaties with the United States government. In these treaties, these tribes became co-managers of the salmon and retained their rights to continue their fishing, hunting, gathering and pasturing practices. Each treaty contained a provision securing the tribes' right to take "fish at all usual and accustomed places in common with citizens of the United States." This included the right to fish inside their respective reservations, as well as outside of their ceded areas.

In the federal court cases, United States v. Oregon and United States v. Washington, the United States Supreme Court has confirmed that the tribes are entitled to 50 percent of the harvestable number of fish destined to pass usual and accustomed fishing locations. Furthermore, in 1975, Judge Belloni, from the United States v. Oregon case, applied the 50/50 standard to the Columbia River. Finally, a decision in 1980 came into effect saying that hatchery salmon do count in the number allowed to be caught by the tribes.

These decisions apply to the following four federally recognized Columbia River treaty tribes:

3.1.9.1 Nez Perce Tribe:

- 1992 Land Base: 750,000 acres, 13% owned by tribe
- 1992 Tribal Population: 3,000 people
- 1992 Tribal Fisheries: Clearwater River, Columbia River, Rapid River, North Fork Salmon River, and Selway River

3.1.9.2 Confederated Tribes of theUmatilla Indian Reservation:

- 1992 Land Base: 172,000 acres, about 50% owned by tribe
- 1992 Tribal Population: 1,456 people
- 1992 Tribal Fisheries: Columbia River, Lookingglass Creek, and Umatilla

3.1.9.3 Confederated Tribes of theWarm Springs Indian Reservation of Oregon:

- 1992 Land Base: 640,000 acres
- 1992 Tribal Population: 3,410 people
- 1992 Tribal Fisheries: Columbia River, Deschutes River at Sherar's Bridge, John Day River, and Warm Springs River

3.1.9.4 Confederated Tribes And Bands of theYakama Indian Nation:

- 1992 Land Base: 1.2 million acres
- 1992 Tribal Population: 8,344 people
- 1992 Tribal Fisheries: Columbia River, Klickitat River, Wenatchee River, Wind River and Yakima River

Beyond these four treaty tribes, there are many other tribes in the Columbia River basin that do not have reserved rights to the salmon. In the 1950s, federal trusteeship of roughly 3 percent of the country's Indian population was terminated, and these tribes were no longer recognized by the federal government. In recent years, vigorous efforts have taken by federally unrecognized tribes to reestablish the trust relationships. Such non-federally recognized tribes and bands along the Columbia River include the Chinook Tribe, Cowlitz Tribe, and Klickitat Tribe. These tribes are important stakeholders in the management of the lower Columbia River and estuary.

3.1.10 *Non-Governmental Agencies*

The Pacific Northwest is a unique region characterized by a large number of non-governmental conservation organizations working to protect the environment. These groups vary in terms of their location, mission, and structure. Many concentrate on educational issues regarding the river and water quality and living resources protection, while others play more of an advocacy role. The following list includes some of the non-governmental groups located in the Lower Columbia River basin. The list is not exhaustive.

3.1.10.1.1 1000 Friends of Oregon, Portland, OR

Nonprofit public service organizationworking to realize Oregon's land use laws at the state and local levels

3.1.10.1.2 American Fisheries Society, Portland, OR

Conservation organization which promotes protection of critical fish habitat through science and education

3.1.10.1.3 American Rivers -NW Region, Seattle, WA

Conservation organization that defends the quality of our drinking water, the natural beauty of our environment, the recreational value of our waterways, and the countless species of plants and animals they support

3.1.10.1.4 Association of Northwest Steelheaders, Milwaukie, OR

Conservation group dedicated to the preservation and enhancement of steel head, trout, and salmon

3.1.10.1.5 Audubon Society, Portland, OR

Nonprofit, conservation organization that promotes enjoyment, understanding, and protection of the natural world, particularly native wildlife and its habitat

3.1.10.1.6 Audubon Society, Vancouver, WA

3.1.10.1.7 Audubon Society--Columbia Gorge Region, Hood River, OR

3.1.10.1.8 Clark County Natural Resources Council, Vancouver, WA

Conservation group working to preserve, protect, and enhance the natural resources and environment of Clark County through education and advocacy

3.1.10.1.9 Clark County Water Quality Resource Council, Vancouver, WA

Conservation, umbrella group for eight Clark County drainage basins with steward members who monitor, report, and work to improve surface and groundwater quality in

3.1.10.1.10 Clark County Columbia Land Trust, Vancouver, WA

Grassroots group that acquires, sells, or exchanges real property in order to pre serve it for open space, habitat, and protec tion of water quality and quantity

3.1.10.1.11 Columbia Slough Watershed Council, Portland, OR

Conservation organization that provides a forum for information and collaborative efforts within the watershed to address protection and enhancement of the Slough

3.1.10.1.12 Defenders of Wildlife, Lake Oswego, OR

Conservation group dedicated to the perpetuation of all native species and their enjoyment to the public

3.1.10.1.13 Environmental Information Center, Vancouver, WA

Environmental education provider that serves as a clearinghouse for environmen tal information in Clark County

3.1.10.1.14 Friends of the Columbia Gorge, Portland, OR

Conservation group that works to protect the Columbia Gorge through education, legal work, and forest and land use monitoring

3.1.10.1.15 Friends of Wetlands, Portland, OR

Grassroots organization that promotes the preservation, enhancement, and restoration of wetlands in the greater Portland Vancouver area

3.1.10.1.16 Greenpeace USA,Portland, OR

Conservation group that strives to create a green and peaceful world by conducting campaigns on forest issues, ocean protection, toxic poisoning, and safe nuclear energy

3.1.10.1.17 Lower Columbia Fish Enhancement Group, Vancouver, WA

Conservation group that assists the WA Department of Fish and Wildlife with its goal to double the salmon runs by the year 2000

3.1.10.1.18 National Coalition for Alternatives to Pesticides, Eugene, OR

Conservation group that provides assistance in developing model policies to protect our groundwater, food supply, and forest watersheds from pesticide contamination

3.1.10.1.19 National Wildlife Federation - Western Natural Resource Center Portland, OR

Conservation group whose purpose is to educate, inspire, and empower individuals and organizations to take actions to conserve fish, wildlife, and other natural resources

3.1.10.1.20 The Nature Conservancy of Oregon, Portland, OR

Conservation group that purchases and manages natural areas in order to protect habitat for Oregon's plants, wildlife, and ecosystems

3.1.10.1.21 Northwest Earth Institute, Portland, OR

Conservation group dedicated to providing individuals with opportunities to consider how their values and habits affect the earth

3.1.10.1.22 Northwest Environmental Advocates, Portland, OR

Environmental advocacy organization work ing to restore the environment of the Pacific Northwest by working on water and air quality, safe energy, and habitat protection issues; primarily in the Columbia River basin

3.1.10.1.23 Northwest Environmental Defense Center, Portland, OR

Environmental information provider that provides legal and scientific services in the public interest with special emphasis on water quality issues

3.1.10.1.24 Oregon Adopt-A-River, Hillsboro, OR

Conservation group which helps volunteers adopt a stretch of any Oregon river, stream, creek or lakefront in order to clean up and preserve the waterways

3.1.10.1.25 Oregon Environmental Council, Portland, OR

Conservation organization that works to lessen human impacts on Oregon's air, water, and land

3.1.10.1.26 Oregon Natural Resources Council, Portland, OR

Conservation group that works to protect and enhance the natural resource values on public lands, waters and oceans

3.1.10.1.27 Oregon Trout, Portland, OR

Conservation group that works to change man agement of fish populations and their habitats

3.1.10.1.28 Oregon Water Trust, Portland, OR

Conservation organization that uses a market based approach to help maintain and enhance surface water flows to benefit the state's fisheries and other aquatic species

3.1.10.1.29 Oregon Waterfowl and Wetlands Association, Portland, OR

Conservation group dedicated to preserving, protecting, and restoring wetlands and wildlife

3.1.10.1.30 Oregon Wildlife Federation, Milwaukie, OR

Conservation organization dedicated to the preservation, conservation, and enhancement of our natural resources, wildlife, fish, and habitat

3.1.10.1.31 Pacific Rivers Council, Portland, OR

Nonprofit organization that develops scientific tools, legislative policies, and community enhancement strategies to restore the ecologi cal integrity and sustainable human use of America's river systems

3.1.10.1.32 Ridgefield National Wildlife Refuge, Ridgefield, WA

Wintering/migrating area for waterfowl

3.1.10.1.33 River Network, Portland, OR

Conservation group dedicated to helping people save rivers

3.1.10.1.34 Sauvie Island Conservancy, Portland, OR

Grassroots group dedicated to the preservation of island rural life, wildlife, and natural recreation areas

3.1.10.1.35 Save Our Salmon, Portland, OR

Conservation coalition of 44 environmental, fishing, and energy groups to coordinate the efforts to save salmon species and habitat

3.1.10.1.36 Sea Resources, Chinook, WA

Conservation group working on a revitalization project on the Chinook River; includes salmon research and student education

3.1.10.1.37 Sierra Club Columbia Group, Portland, OR

Conservation organization that addresses issues in the Columbia Basin related to ancient forest preservation, energy conservation, transportation, and population

3.1.10.1.38 Sierra Club SW Washington Group, Vancouver, WA

Conservation organization that addresses issues in Clark, Cowlitz, and Skamania counties related to growth management, wetland and forest issues, and wildlife habitat protection

3.1.10.1.39 Trout Unlimited Gladstone, OR Hillsboro, OR

Conservation organization that works to preserve, protect, and enhance the cold-water fishery

3.1.10.1.40 Trust for Public Land, Portland, OR

Nonprofit land conservation organization that helps citizen groups and public agencies to protect open space lands having significant natural, recreation, historical, cultural, or scenic resources

3.1.10.1.41 Urban League of Portland, Portland, OR

Advocacy organization that has developed an "E" team environmental program which focuses on environmental justice, toxics, greenspaces, parks, and outreach for the Coalition for a Livable Future

3.1.10.1.42 Washington Environmental Council, Seattle, OR

Conservation organization working to pro tect, preserve, and restore the environment of Washington State

3.1.10.1.43 WaterWatch of Oregon Portland, OR

Grassroots organization dedicated to protecting the public interest in Oregon's water by restoring and protecting instream flow in rivers and streams

3.1.10.1.44 The Wetlands Conservancy, Tualatin, OR

Conservation group and land trust that owns and manages wetlands for their many values to society and wildlife

3.1.10.1.45 Wildlife Too, Warren, OR

Conservation group that works to protect and enhance wildlife habitat and resource lands throughout Columbia County

3.1.10.1.46 Wild Salmon Nation, Portland, OR

Grassroots group that advocates for public support of abundant wild salmon

3.1.11 *Port Districts*

3.1.11.1 Oregon Ports

3.1.11.1.1 Port of Astoria

- Port Piers and Lands, Astoria
- Airport and Lands, Warrenton
- Industrial Park, Warrenton
- West Basin Marina, Astoria
- East Basin Marina, Astoria
- Skipanon Property, Astoria
- Red Lion Restaurant and Convention Center, Astoria

3.1.11.1.2 Port of Cascade Locks

- Interstate Toll Bridge, City of Cascade Locks
- 2 Sternwheeler Vessels, City of Cascade Locks
- Marine Park (100 acre), City of Cascade Locks
- Visitors Center and Gift Shop, City of Cascade Locks
- Museum, City of Cascade Locks
- Public Marina (75 slips), City of Cascade Locks
- Wind-surfing Beach, City of Cascade Locks
- Industrial Park (175 acres), City of Cascade Locks

3.1.11.1.3 Port of Hood River

- 3 Industrial Parks, City of Hood River
- Public Marina (151 slips) , City of Hood River
- Airport, City of Hood River
- Hood River/White Salmon, City of Hood River
- Toll Bridge, City of Hood River

3.1.11.1.4 Port of Portland

- Portland International Airport, City of Portland
- PDX International Center, City of Portland
- Terminal 1,2,4,5,6, City of Portland
- Portland Ship Yard, City of Portland

- Industrial Park, City of Portland
- Troutdale Airport, City of Troutdale
- Hillsboro Airport, City of Hillsboro
- Pier 33, City of Portland

3.1.11.1.5 Port of St. Helens

- Airport, City of Scapoose
- Public Marina (80 slip), City of St. Helens
- Industrial Parks (3), City of St. Helens
- Industrial Park, City of Columbia City
- Industrial Park, City of Ranier
- Industrial Park City of Scapoose, City of Clastkanie

3.1.11.2 Washington Ports

3.1.11.2.1 Port of Camas-Washougal

- Airport (65-plane general aviation), Clark County
- Pleasure Boat Marina (350 slip), City of Washougal
- Gibbons Creek (Pump Overflow) , City of Washougal
- Industrial Park, , City of Washougal

3.1.11.2.2 Port of Chinook

- Marina (380 slips), City of Chinook
- Seafood Processing Plant, City of Chinook

3.1.11.2.3 Port of Ilwaco

- Airport, City of Ilwaco
- Marina (950 slips), City of Ilwaco
- Boat Storage Yard, City of Ilwaco

3.1.11.2.4 Port of Kalama

- Public Marina (222 slips), City of Kalama
- Wastewater Treatment Plant, Cowlitz County
- Industrial Park, Cowlitz County
- RV Park, Cowlitz County
- Marine Park, City of Kalama (1/2), Cowlitz County (1/2)

3.1.11.2.5 Port of Longview

- Marine Terminals, City of Longview
- Industrial Properties, City of Longview

3.1.11.2.6 Port of Ridgefield

- Golf Course, Clark County
- Industrial Parks (2), City of Ridgefield

3.1.11.2.7 Port of Skamania

- Industrial Park, City of North Bonneville

- Industrial Park, City of Stevenson
- Sternwheeler Dock, City of Stevenson
- Day-use Boat Launch, City of Stevenson

3.1.11.2.8 Port of Vancouver

- Industrial park (40 tenants), City of Vancouver
- Marine Operations (4 terminals), City of Vancouver
- 1000 acres undeveloped land, City of Vancouver
- City of Vancouver
- City of Vancouver

3.1.11.2.9 Port of Wahkiakum I

- Marina (200+ slips), Town of Cathlamet

3.1.11.2.10 Port of Wahkiakum II

- Public Park, Town of Skamokawa

3.1.11.2.11 Port of Woodland

- Industrial Parks (2), City of Woodland
- Undeveloped Waterfront Property, Cowlitz County

3.2 Plans, Programs, projects

To help develop the management plan, planning partners and stakeholders provided information relevant to the Lower Columbia Estuary and mainstem. This information includes plans, programs, projects and research. While the previous section (agencies and authorities) provides the framework under which programs and plans exist, this section provides additional information about the actual activities in and related to the subbasins.

This list includes those activities forwarded to the subbasin planning team or identified by the planning team as relevant to this effort. As such, it is by no means, a comprehensive list. The Lower Columbia Fish Recovery Board, a partner in this subbasin planning effort, also has programs and projects summarized as part of its planning efforts for 11 Washington subbasins in the Lower Columbia Estuary and Lower Mainstem province. This information is included LCFRB's Lower Columbia Salmon and Steelhead Recovery and Subbasin Plan Technical Foundation, Volume 4: Programs and Projects Directory.

Also, the Lower Columbia River Estuary Partnership is compiling a comprehensive database on the restoration activities in the two subbasins. The information from process will be integrated into this inventory once completed.

In collecting and summarizing the estuary activities, classification of these activities presents a challenge. One interest's program is another's project; some projects include plans; some plans include research. In other words, the boundary between categories is often crossed.

To avoid wide-spread repetition in this inventory, the planning team developed a single, sortable database, which can be built upon and amended as future activities are added.

These programs, plans, projects and RME studies are listed in the table below, along with the lead agency (or agencies) for each. The type of activity is identified, as is the subbasin area (E-Estuary; M-Mainstem or B-both) to which the activity applies. Summaries of each of these activities are included later in this section in alphabetical order by the activity's title. The titles used are, in most cases, those provided by the respective sponsoring agency. In some cases, the titles have been modified to ensure that the title is descriptive in this context.

Table 3-2: Condensed list of plans, programs, project, or other RME activities (E=Estuary; M=Mainstem; B=Both)

Name of Program , Plan, Project or RME activity	Lead Organization	Reach	Program	Plan	Project	RME
Abernathy, Germany, and Mill Creeks—Multiple Projects	WDFW	E			X	
Acoustic Tracking Array for Studying Ocean Survival and Movements of Columbia River Salmon (BPA#3007)	Kintama Research Organization	E			X	X
Action Plan to Implement the Federal Columbia River Power System Biological Opinion in the Columbia River Estuary	BPA Fish and Wildlife Division, USACE	E		X		
Agency Partnering, WDFW, Columbia Land Trust and the City of Vancouver	WDFW, Columbia Land Trust, City of Vancouver	M		X	X	
Aquatic Conservation Strategy, Forest Service Management Plan	USDA Forest Service	B	X	X		
Avian Predation on Juvenile Salmonids in the Lower Columbia River: Multiple Projects	USGS, Oregon Cooperative F&W Research Unit at OSU, Columbia River Inter-Tribal Fish Commission	M			X	
Biological Opinions and 2004/2004-2008 Implementation Plan	NOAA Fisheries, USFWS, BPA, USACE, US Bureau of Reclamation	B		X		
Bi-State Water Quality Program, States of Oregon and Washington, 1989	WA Department of Ecology, OR DEQ	B	X			
Blind Slough Restoration Project - Brownsmead, Oregon, (CRE #200301500, BPA#30004)	CREST	E			X	
Bonneville Tributaries Subbasin – Limiting Factors Analysis, 2000	WA State Conservation Commission	M			X	
Bull Trout Biological Opinion Effects to Listed Species from Operations of the Federal Columbia River Power System - SEE Biological Opinions and 2004/2004-2008 Implementation Plan	USFWS	B		X		
Canada-USA Shelf Salmon Survival Study (BPA#30010)	Fisheries & Oceans Canada Pacific Biological Station Nanaimo, B.C. Canada V9R 5K6	E				X
Caspian Tern 2000 Draft Season Summary - SEE Avian Predation on Juvenile Salmonids in the Lower Columbia River: Multiple Projects	Oregon State University, WDFW, Columbia River Inter-Tribal Fish Commission, Real Time Research				X	
Characterization of Salmon Habitat in the Tidal-Fluvial Reach of the	University of Portland	E			X	X

Name of Program , Plan, Project or RME activity	Lead Organization	Reach	Program	Plan	Project	RME
Columbia River to Support Recovery Planning (BPA#30017)						
Chinook River Restoration and Monitoring SEE Pacific Coastal Salmon Recovery Fund (PCRF)	Sea Resources	E			X	
Deep River Restoration SEE Pacific Coastal Salmon Recovery Fund (PCRF)	Columbia Land Trust	E			X	
Coastal Cutthroat Movements in the Columbia River Estuary (BPA #30009)	USFWS	E			X	X
Columbia River Channel Improvements Biological Assessment	USACE	B				X
Columbia River Estuary and The Columbia River Basin Fish and Wildlife Program Report, 2000	Independent Scientific Advisory Board (ISAB), NWPPC	B				X
Columbia River Estuary Atlas of Physical and Biological Characteristics, Columbia River Estuary Data Development Program (CREDDP), 1984	Columbia River Estuary Data Development Program (CREDDP)	E				X
Columbia River Estuary Dredged Material Management Plan, 2001, CREST	CREST	E		X		
Columbia River Estuary Regional Management Plan, 1979, Columbia River Estuary Study Taskforce	CREST	E		X		
Columbia River Terminal Fisheries Research Project (BPA# 199306000) (aka Evaluate Columbia River Select Area Fisheries, and Select Area Fishery Evaluation Project)	ODFW, WDFW, CCEDC	B			X	X
Comprehensive Conservation and Management Plan for the Lower Columbia River, 1999	LCREP	E		X		
Conservation Planning & Implementation SEE Pacific Coastal Salmon Recovery Fund (PCRF)	East Multnomah SWCD	B			X	
Consideration of Ocean Conditions in the Management of Salmon	Bisbal and McConnaha, 1998	B				X
Ecology of Bald Eagles on the Lower Columbia River, 1988	Oregon State University	B			X	X
Ecology Of Marine Predatory Fishes: Influence on Salmonid Ocean Survival, 1998 to present	NMFS	E			X	X

Name of Program , Plan, Project or RME activity	Lead Organization	Reach	Program	Plan	Project	RME
Ecosystem Restoration Plan with Emphasis on Salmonids in the Columbia River Estuary (159 Plan)	USACE	E		X		
Effectiveness Monitoring of the Chinook River Estuary Restoration Project (BPA#30006)	Sea Resources	E			X	X
Endangered Species Act 2004/2004-2008 Implementation Plan for the Federal Columbia River Power System	USACE, US Department of the Interior Bureau of Reclamation, BPA	B		X		
Endangered Species Management Plans for Lower Columbia Coho Salmon	Multiple Agencies	B		X		
ESA Salmon Recovery Planning	NOAA Fisheries, USFWS, States of OR and WA	B		X		
Estuarine Habitat and Juvenile Salmon – Current and Historic Linkages in the Lower Columbia River and Estuary, 2000-present	NMFS, USACE, University of Washington, ODFW, WDFW, Oregon Graduate Institute	E				X
Estuarine Habitat Restoration/Reconnection of Clatskanie River SEE Pacific Coastal Salmon Recovery Fund (PCRF)	Lower Columbia Watershed Council	B			X	
Evaluate Live Capture Selective Harvest Methods for Commercial Fisheries on the Columbia River (BPA# 200100700) *(Not same project as Col Riv Terminal Fisheries Research)*	ODFW, WDFW	B			X	X
Evaluation of Spawning for Fall Chinook and Chum Salmon just below the four Lower most Columbia River Dams (BPA 1999-003-001)	WDFW	M			X	X
Expedited Reconnaissance Study 2001		B				X
Feasibility Study for Pacific Ocean Salmon Tracking (POST) (CRE Project 200008000) - SEE An Acoustic Tracking Array for Studying Ocean Survival and Movements of Columbia River Salmon (BPA#3007)	Kintama Research Organization				X	
Franz Lake National Wildlife Refuge Management Plan	USFWS, Franz Lake National Wildlife Refuge	M		X		
Grays Bay Restoration (multiple phases) SEE Pacific Coastal Salmon Recovery Fund (PCRF)	Columbia Land Trust	E			X	
Gourlay Creek Fish Passage and Fish Habitat Project (LCR Project	City of Scappoose, OR	M			X	

Name of Program , Plan, Project or RME activity	Lead Organization	Reach	Program	Plan	Project	RME
200103800)						
Habitat Criteria Summary/Workshop Outcomes, Lower Columbia River (draft)	CREST, LCREP, USACE, American Rivers, 2001	B				X
Habitat Restoration Site Inventory 2001	LCREP, CREST	B				X
Habitat Restoration Program, 2004	LCFRB	B				X
Historic Habitat Opportunities and Food-Web Linkages of Juvenile Salmon in the Columbia River Estuary and Their Implications for Managing River Flows and Restoring Estuarine Habitat	NMFS Northwest Fisheries Science Center	E				X
Historical Population Structure of Willamette and Lower Columbia River Basin Pacific Salmonids	NMFS Northwest Fisheries Science Center, WDFW	M				X
Identifying Historical Populations of Chinook and Salmon and Steelhead within the Lower Columbia River and Upper Willamette River ESUs, May 2002 - SEE Historical Population Structure of Willamette and Columbia River Basin Pacific Salmonids	NMFS Northwest Fisheries Science Center, WDFW					X
Implement the Habitat Restoration Program for the Columbia Estuary and Lower Columbia River. (CRE#200301100, BPA#30016)	LCREP and CREST	B			X	
Independent Multidisciplinary Science Team (IMST) Report on the Recovery of Wild Salmonids in Western Oregon Lowlands	Independent Multidisciplinary Sicence Team (IMST)	E				X
Independent Populations of Chinook, Steelhead, and Sockeye for Listed Evolutionarily Significant Units Within the Interior Columbia River Domain	Interior Columbia Basin Technical Recovery Team	M				X
Interagency Fish Passage	USFWS	B	X		X	
Interim Report on Viability Criteria for Willamette and Lower Columbia Basin Pacific Samonids	Willamette/Lower Columbia River Technical Review Board	M				X
Lewis and Clark National Wildlife Refuge	USFWS, Lewis and Clark National Wildlife Refuge	E		X		
Lower Columbia Fish Recovery Board Subbasin Planning	LCFRB	B		X		
Lower Columbia Habitat Mapping	LCREP	B			X	X

Name of Program , Plan, Project or RME activity	Lead Organization	Reach	Program	Plan	Project	RME
(LCR #200201200)						
Lower Columbia River and Columbia River Estuary Ecosystem Monitoring and Data Management (CRE#200301700, BPA#30015)	LCREP	B			X	X
Lower Columbia River and Estuary Research Needs Identification Workshop Proceedings 2003	USACE	E				X
Lower Columbia/Clatskanie Watershed Assessment	Lower Columbia River Watershed Council	B			X	X
Lower Columbia: Grays River Estuary SEE Pacific Coastal Salmon Recovery Fund (PCRF)	Columbia Land Trust	E			X	
Map Subtidal Large Woody Debris and Other Habitat Features in Relation to Fish Distribution in the Lower Columbia River Estuary (BPA#30014)	Battelle Marine Sciences Laboratory	E			X	X
McCarthy Creek Wetland RestorationSEE Pacific Coastal Salmon Recovery Fund (PCRF)	Ducks Unlimited	M			X	
Monitoring of the Chinook River Estuary Restoration Project. (CRE Project 200301600)	Sea Resources	E			X	X
Native Fish Conservation Policy *(See website for other policies)*	ODFW	B	X			
Ocean Survival Of Juvenile Salmonids In The Columbia River Plume, 1998 to present (CRE 2000 Project 199801400)	NMFS Northwest Fisheries Science Center, Oregon Sate University, Oregon Graduate Institute	E				X
Optimization of FCRPS Impacts on Juvenile Salmonids: Restoration of Lower-Estuary and Plume Habitats (BPA#30002)	OHSU, Oregon Graduate Institute	E			X	X
Oregon Columbia Tributaries West: Watershed Analysis, 2001	USDA Forest Service, Columbia River Gorge NSA	M				X
Oregon Spartina Response Plan	Oregon Department of Agriculture	E		X		
Pacific Bald Eagle Recovery Plan, 1986	USFWS (NO NEED FOR REVIEW)	B		X		
Pacific Coastal Salmon Recovery Fund (multiple projects in this matrix)	States of Washington, Oregon, California and Alaska, NOAA	B	X			
Passage of Juvenile and Adult Salmonids at Columbia and Snake River Dams	NMFS Northwest Fisheries Science Center	M				X
Pierce National Wildlife Refuge	USFWS, Pierce National Wildlife Refuge	M		X		

Name of Program , Plan, Project or RME activity	Lead Organization	Reach	Program	Plan	Project	RME
Preliminary Conclusions Regarding the Updated Status Of Listed ESUs of West Coast Salmon and Steelhead	West Coast Salmon Biological Review Team, Northwest Fisheries Science Center, Southwest Fisheries Science Center	B				X
Preserve and Restore Columbia River Estuary Islands to Enhance Juvenile Salmonid and Columbian White-tailed Deer Habitat (CRE#200301800, BPA#30011)	USFWS - Willapa National Wildlife Refuge Satelites, Columbia Land Trust, USGA - BRD Columbia River Research Laboratory	E			X	
Re-introduction of Lower Columbia River Chum Salmon into Duncan Creek (LCR Project 200103800)	WDFW	M			X	
Research , Monitoring, and Evaluation Plan for the Columbia River Estuary and Plume	BPA, USACE, NOAA Fisheries (NMFS)	E	X	X		X
Return to the River	Independent Science Group	B				X
Review of Methods, Progress and Cross-validation Studies Pertaining to Population Trend and Risk Assessment for Columbia River Salmonids - *Draft Technical Memorandum*	NMFS Northwest Fisheries Science Center	B				X
Review of Relative Fitness of Hatchery and Natural Salmon - *Draft Technical Memorandum*	NMFS Northwest Fisheries Science Center	B				X
Revised Columbia White-Tailed Deer Recovery Plan, *1976*	USFWS	B		X		
Role of the Estuary in the Recovery of Columbia River Basin Salmon and Steelhead: And Evaluation of Limiting Factors	NMFS Northwest Fisheries Science Center	E				X
RPAs		B		X		
Salmon and Steelhead Limiting Factors Water Resource Inventory Area 24-28, 2000	Washington State Conservation Commission	B				X
Salmon at the River's End, NMFS, 2001 - IN PROCESS	NMFS	E				X
Salmon Steelhead Habitat Inventory Assessment Program (SSHIAP)	WDFW	B	X			X
Salmonid Population and Habitat Monitoring in the Oregon Portion of the Columbia Estuary (BPA#30018)	ODFW	B			X	X
Sandy River Delta Plan and EIS 1996, Watershed Analysis, 1995	USDA Forest Service, Columbia River Gorge NSA	M			X	
Sandy River Watershed Riparian SEE Pacific Coastal Salmon Recovery	Nature Conservancy	E	X		X	

Name of Program , Plan, Project or RME activity	Lead Organization	Reach	Program	Plan	Project	RME
Fund (PCRF)						
Scappoose Bay Watershed Assessment, 2000	Scappoose Bay Watershed Council	M				X
Skipanon, Youngs Bay, Nicolai Wickiup Watersheds Action Plans, May 2003 (See also: Youngs Bay . . .Watershed Assessments)	Oregon Watershed Enhancement Board, Skipanon, Youngs Bay, Nicolai Wickiup Watershed Councils	E		X		
Status Assessment and Conservation Recommendations of the Caspian Tern in North America, 2002	USFWS	B				X
Steigerwald Lake National Wildlife Refuge	Steigerwald Lake National Wildlife Refuge	M		X		
Subbasin Plan 1990		B		X		
Support Local Salmon Corps Projects SEE Pacific Coastal Salmon Recovery Fund (PCRF)	CRITFC Columbia River Inter-tribal Fish Commission	B	X		X	
Survival and Growth of Juvenile Salmonids in the Columbia River Plume	NMFS	E			X	X
TMDL		B		X		
US Fish and Wildlife Recovery Planning *SEE* ESA Salmon Recovery Planning	USFWS	B		X		
Washington and Oregon Eulachon (Columbia River smelt) Management Program	WDFW, ODFW	B	X			X
Washington State Salmon Recovery Strategy (*See* ESA Salmon Recovery Planning)				X		
Washougal River: Slough Creek Riparian SEE Pacific Coastal Salmon Recovery Fund (PCRF)	State Parks	M			X	
Western Washington Columbia River Tributaries Watershed Analysis, 2001	USDA Forest Service Columbia River Gorge NSA	M				X
Wetlands Functional Assessment City of Vancouver Marine Park	City of Vancouver Water Resources Education Center	M				X
White Sturgeon Mitigation and Restoration in the Columbia and Snake Rivers Upstream from Bonneville Dam	WDFW, ODFW, USGS	M	X		X	
Wood's Landing Chum Spawning Site Protection (BPA#31006)	City of Vancouver	B			X	

Name of Program , Plan, Project or RME activity	Lead Organization	Reach	Program	Plan	Project	RME
Wood's Landing Chum Spawning Site Protection SEE Pacific Coastal Salmon Recovery Fund (PCRF)	Columbia Land Trust	B	X		X	
Working Implementation Plan for Bald Eagle Recovery in Oregon and Washington, July 1990	WDFW, OR-WA Interagency Wildlife Committee	B		X		
Wy-Kan-Ush-Mi Wa-Kish-Wit Spirit of the Salmon The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes	Nez Perce, Umatilla, Warm Springs, and Yakama Tribes	B		X		
Youngs Bay, Nicolai-Wickiup River and Skipanon River Watershed Assessments, 1999	Youngs Bay Watershed Council, Nicolai-Wickiup Watershed Council, Skipanon River Watershed Council	E				X

3.2.1 *Abernathy, Germany, and Mill Creeks—Multiple Projects*

Lead: Washington Department of Fish and Wildlife

Related to the mainstem Columbia, the Washington Department of Fish and Wildife is implementing projects to determine abundance and monitor natural production of juvenile, smolt and adult salmonids in Abernathy, Germany and Mill Creeks. Adult trapping of coho will provide additional data necessary to better evaluate the origin (hatchery vs. wild) of naturally produced smolt.

These projects include:

- Juvenile Trapping: The WDFW began trapping juvenile coho and steelhead outmigrants in the spring of 2001 on Abernathy, Germany and Mill Creeks. A cone screw-trap was used on Abernathy Creek, and “V”-weirs were used on Germany and Mill Creeks to develop juvenile/smolt production estimates for these systems.
- Adult Trapping: The WDFW is preparing to trap adult fish (primarily coho) on Abernathy creek beginning in October 2001.
- Steelhead Redd Surveys: The WDFW conducts annual winter steelhead redd surveys on these creeks to develop wild winter steelhead population estimates.
- Chinook/Coho Spawning ground surveys: PSMFC conducts these surveys to recover CWTs and gather data for natural spawner escapement estimates.

3.2.2 *Acoustic Tracking Array for Studying Ocean Survival and Movements of Columbia River Salmon (BPA #30007)*

Lead: Kintama Research Organization

There is evidence that different regions of the Pacific Ocean respond in different ways to climate change. These differences should affect the productivity of salmon stocks if specific stocks migrate to different regions.

This project will provide key information on the migratory behaviour and feeding areas of individual stocks of salmon in the ocean. It will develop and evaluate a tracking array to help determine where upper Columbia and Snake River chinook migrate to, and also measure the efficacy of the array in the river and at sea. If results from this pilot study are successful, it will be possible to expand the array's geographic extent and allow concurrent studies on the movements of a wide variety of other Columbia River anadromous fish stocks (all species of salmon, sturgeon, eulachons, shad, and lamprey) at low incremental cost.

The project assesses the feasibility of the array concept on upriver chinook. As a species, the marine distribution of juvenile chinook makes them particularly amenable to experimental evaluation in a pilot study, thereby improving the likelihood that the testing and evaluation phase will be a success. At the same time the project should be able to provide testable scientific results on whether the different survivals of Upper Columbia and Snake River chinook stocks is due these stocks residing in different regions of the coastal ocean. This information will directly address several key areas identified in the 2000 Biological Opinion.

The 2000 Biological Opinion directs the Federal Columbia River Power System (FCRPS) operators to evaluate the full life cycle of the Snake and Columbia River salmon and steelhead. The marine phase of the life history is only dimly understood. Various assumptions have been made in regional planning and computer modeling efforts that the effects of passage through the hydrosystem cause delayed mortality in the estuary or the ocean or that collection and transportation around the dams cause differentially higher delayed mortality than experienced by in river migrants. Major regional decisions and the fate of the fish listed under the Endangered Species Act depend on knowing where mortality is occurring, and what management measures are appropriate to reduce mortality.

This project was a culmination of several previous studies, including A Feasibility Study for Pacific Ocean Salmon Tracking (POST) (CRE Project 200008000).

3.2.3 *Action Plan to Implement the Federal Columbia River Power SYSTEM Biological Opinion in the Columbia River Estuary (Prepared in Response to RPA 158)*

Leads: BPA, USACE

The Fish and Wildlife Division of the Bonneville Power Administration and the U. S. Army Corps of Engineers (known collectively as the Action Agencies for this plan) prepared this Action Plan in response to Reasonable and Prudent Alternative Action 158 of the National Marine Fisheries Service's (NOAA Fisheries) Biological Opinion (BiOp) on operation of the Federal Columbia River Power System, dated December 21, 2000. The intent is to develop a useful Action Plan that articulates the Action Agencies' completed, ongoing, and planned work that implements the BiOp in the Columbia River Estuary, while fulfilling Reasonable and Prudent Alternative Action 158. The actions outlined in this document are collectively referred to as the Action Agencies' "Estuary Program."

A core team of staff from the Bonneville Power Administration, Corps of Engineers, Pacific Northwest National Laboratories, and NOAA Fisheries, developed the Action Plan based on the agencies' current, planned, and future work to meet the Reasonable and Prudent Alternatives that relate to the Columbia River Estuary.

3.2.4 *Agency Partnering, WDFW, Columbia Land Trust and the City of Vancouver*

Leads: WDFW, Columbia Land Trust and the City of Vancouver

Several agencies developed a plan to protect the area between the Grays River and Hamilton/Hardy Creeks in Vancouver, Washington, approximately one mile upstream of the I-205 bridge on the north shore of the Columbia River, under the guidelines of the 2000 FCRPS biological opinion, action 157. The partners, including WDFW, Columbia Land Trust and the City of Vancouver, submitted a grant proposal to the Washington State Salmon Recovery Funding Board to acquire the parcel of land adjacent to the seeps and conservation easements on two surrounding pieces of property.

The partners have identified an additional land acquisition and purchase of conservation easements of the uplands, wetlands and creek. This second project would entail development of an offshore spawning channel, habitat restoration, removal of non-native plants and vegetation, removal of a fish passage barrier, educational tours and installation of a salmon-viewing camera. WDFW would continue biological research and monitoring for spawning adults, and emerging and outmigrating juveniles.

3.2.5 *Aquatic Conservation Strategy, Forest Service Management Plan*

Lead: United States Forest Service

The Aquatic Conservation Strategy, an integral part of the Northwest Forest Plan, was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy protects salmonid habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of the Pacific Ocean anadromy. The components of the Aquatic Conservation Strategy are Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration.

3.2.6 *Avian Predation on Juvenile Salmonids in the Lower Columbia River: Multiple Projects*

Lead: USGS-Oregon Cooperative Fish and Wildlife Research Unit, Oregon State University, and the Columbia River Inter-Tribal Fish Commission

This effort was initiated in 1997 to assess the impacts of piscivorous waterbirds (i.e., gulls, terns, and cormorants) on the survival of juvenile salmonids in the lower Columbia River. The effort consists of multiple projects funded by BPA between 1998 and 2003.

The project funded in 1998 estimated the numbers of juvenile salmonids consumed by colonial waterbirds (i.e., double-crested cormorant, Caspian tern, California gull, ring-billed gull, glaucous-winged gull) in the lower Columbia River, and identified avian predation conditions and locales.

The project funded in 1999 developed a management plan to reduce avian predation on juvenile salmonids. It implemented chosen management options and evaluated their efficacy through continued monitoring of smolt losses to birds.

The project funded in 2000 monitored and evaluated the efficacy of management initiatives to reduce predation by colonial waterbirds on juvenile salmonids in the lower Columbia River. The project assisted resource managers in the development of a long-term avian predation management plan.

The project funded in 2002 monitored and evaluated the efficacy of management initiatives to reduce predation by colonial waterbirds on juvenile salmonids in the lower Columbia River. It assisted resource managers in the development of a long-term avian predation management plan.

The project funded in 2003 determines predation rates by waterbirds on juvenile salmonids, evaluates the efficacy of management initiatives to reduce avian predation, and assists resource managers in the development of plans for long-term management of avian predation, as warranted.

Season summaries are available at columbiabirdresearch.org. The summaries were compiled by researchers from Oregon State University, U.S. Geological Survey, Columbia River Inter-Tribal Fish Commission, and Real Time

3.2.7 *Biological Opinions and Esa 2004/2004-2008 Implementation Plan*

Leads: NMFS, USFWS, BPA, USACE, Bureau of Reclamation

The National Marine Fisheries Service (NOAA Fisheries) and the U.S. Fish and Wildife Service (USFWS) issued Biological Opinions (BiOps) in December 2000 for the operation and maintenance of the Federal Columbia River Power System (FCRPS). This complex of dams and reservoirs is operated by the U.S. Army Corps of Engineers (Corps), the U.S. Bureau of Reclamation (Reclamation) and the Bonneville Power Administration (BPA), referred to collectively as the Action Agencies. The BiOps examine effects of FCRPS operation on threatened and endangered fish in the Columbia River Basin and prescribe actions to be taken by the Action Agencies to avoid jeopardy to these Evolutionarily Significant Units (ESU) of fish.

The BiOps guide implementation of measures by the Action Agencies to protect and further the recovery of Endangered Species Act (ESA) listed Columbia River basin salmon, steelhead and bull trout, and Kootenai River white sturgeon (See Table 1-1 for a list of these

species). They provide a flexible framework of performance standards for the FCRPS and other conservation measures over the 10-year period from 2000 to 2010.

Implementation plans are called for under the BiOps and provide the conceptual foundation and the management framework for coordinating actions to further recovery. These plans are intended to inform and be informed by, other ongoing state, tribal and regional planning efforts, such as the Northwest Power and Conservation Council's (Council) Fish and Wildlife Program. The 2004/2004–2008 Implementation Plan is the third issued by the Action Agencies and builds on the lessons from our first three years of BiOp planning and implementation.

The Action Agencies again issued this year's one-and five-year implementation plan as a single combined document.

3.2.8 *Bi-State Water Quality Program, States of Oregon and Washington, 1989*

Lead: Washington Department of Ecology, Oregon DEQ

In 1989, the States of Washington and Oregon recognized that more information was needed about the health of the lower Columbia River. A nomination to the National Estuary Program was being discussed, but data was lacking to confirm the degradation that would warrant participation in the program. To address that need, the Lower Columbia River Bi-State Water Quality Program (Bi-State Program) was created in 1990. Its study area was the lower part of the river from Bonneville Dam to the Pacific Ocean, a stretch of 146 river miles.

The Bi-State Program was a public/private partnership jointly administered by the Washington Department of Ecology and the Oregon Department of Environmental Quality and assisted by a Bi-State Steering Committee. Steering Committee members included: environmentalists, industry representatives, private citizens, public ports, local governments, fishing interests, Native American tribes, the Northwest Power Planning Council and state and federal agencies dealing with environmental and natural resource issues.

The Bi-State Program assessed the health of the river by looking at how well the "beneficial uses" of the river were being met. Beneficial uses are defined in state laws and regulations and include water supply, agriculture, fish and wildlife, recreation and commercial uses. The program focused on those beneficial uses that relate to the health of humans, fish and wildlife.

The findings of the Bi-State Program supported nomination of the Lower Columbia River Estuary to the National Estuary Program. The U.S. Environmental Protection Agency announced the Columbia River as one of the waterways accepted into the program in July 1995.

3.2.9 *Blind Slough Restoration Project Brownsmead, Oregon (BPA #30004) (Cre#200301500)*

Lead: Columbia River Estuary Study Taskforce

This project restores tidal exchange between the Columbia River Estuary and Blind Slough in the community of Brownsmead, Oregon. The project includes development and implementation of an effectiveness monitoring program.

The Columbia River Estuary Study Taskforce (CREST), Clatsop Diking Improvement Company No. 7, and the Army Corps have prioritized the following array of activities to restore Blind Slough: installation of water control structures to breach the Blind Slough dike,

replacement and/or installation of five constricted culverts, and channel enhancement. The goal of these activities is to restore historic hydrologic and bio-physical connection to the Columbia River Estuary. Restoration of Blind Slough enhances water quality and reconnects seven miles of habitat for aquatic species including migrating salmonids.

The effectiveness monitoring program partners Clatsop Diking Improvement Company No. 7, CREST, the Nicolai-Wickiup Watershed Council, and volunteer landowners from the Brownsmead area. The monitoring activities assist in testing scientific assumptions developed about reconnecting diked tidelands to the estuarine tidal prism. These assumptions were identified in part by the success of previous restoration projects implemented in the Brownmead area which demonstrated water quality improvements and increased fish access to tidal wetland habitat. Through the development of a comprehensive effectiveness monitoring program, information on water quality improvements and increased fish use of the Blind Slough will be compiled and applied to future restoration projects.

3.2.10 *Bonneville Tributaries Subbasin – Limiting Factors Analysis*

Lead: Washington State Conservation Commission, 2000

A number of the Bonneville subbasin tributaries fall within the Columbia River Gorge National Scenic Area and are protected from future development pressure. However, timber harvests, transportation corridors, passage barriers, and rural development have all contributed to habitat degradation in the subbasin, and smaller communities are rapidly developing.

3.2.11 *Bull Trout Biological Opinion Effects to Listed Species from Operations of the Federal Columbia River Power System*

Lead: U.S. Fish and Wildlife

The U.S. Fish and Wildife Service has reviewed the biological assessment and National Environmental Policy Act documents dated December, 1999 submitted by the Bonneville Power Administration, Corps of Engineers, and the Bureau of Reclamation (Bureau) regarding operations of the Federal Columbia River Power System. The action agencies' request for formal consultation was received in December, 1999. This document represents the Service's biological opinion of the effects of the proposed action on two listed fish species: the endangered Kootenai River white sturgeon (Acipenser transmontanus) and the threatened bull trout (Salvelinus confluentus).

3.2.12 *Canada-USA Shelf Salmon Survival Study (BPA # 30010)*

Lead: Fisheries & Oceans Canada Pacific Biological Station Nanaimo, B.C. CANADA V9R 5K6

This project surveys the size, condition, and biological condition of juvenile salmon occupying the British Columbia & SE Alaskan continental shelf regions in the autumn (October). The survey also includes extensive collection of oceanographic data.

This project develops an expanded, multi-year research survey. The survey maps ocean conditions determining the growth and survival of Pacific salmon along the West Coast of North America from the British Columbia-Washington border into SE Alaska, and identifies which stocks of Columbia River salmon forage in the continental shelf of these areas. The expanded geographic study area is needed because initial results clearly demonstrate that a proportion of the Columbia River salmon are undertaking rapid, directed migrations that quickly take them well out of the area around the mouth of the Columbia River, and into regions with quite different growth and survival potential.

3.2.13 *Characterization of Salmon Habitat in the Tidal-Fluvial Reach of the Columbia River to Support Recovery Planning (BPA) #30017)*

Lead: University of Portland

The Willamette and Lower Columbia Technical Recovery Team has been tasked with developing population delisting criteria for five salmonid Evolutionarily Significant Units (ESUs)1 and assisting the National Marine Fisheries Service (NMFS) and local entities in the development and implementation of habitat recovery measures.

This project facilitates the analysis and recommendations of the Willamette and Lower Columbia Technical Recovery Team (WLC-TRT) and the recently formed Interior Columbia-Snake Technical Recovery Team (ICS-TRT), and generally benefits regional salmon recovery efforts, by identifying and securing essential habitat data on estuary/tidewater areas in the lower Columbia River and its principal tributaries. Consistent with needs identified in the NWPPC's Fish and Wildlife Program, the FCRPS Biological Opinion, and BPA's evaluation criteria for Reasonable and Prudent Criteria, the project addresses four primary objectives:

- Characterize habitat/fish productivity relationships;
- Identify factors for decline and factors that limit recovery;
- Identify early actions for recovery; and
- Identify research, monitoring, and evaluation needs.

The information obtained through this project would enable estimates of current and historic estuary/tidewater habitat capacities, which will be informative in setting goals and monitoring fish performance (e.g., distribution, abundance, and survival and growth rates), and identifying the location, amount, type, and quality of habitat needed to ensure recovery. In combination with data being collected under the auspices of NMFS, USACE, LCREP and other research programs, this project will greatly improve our knowledge base, identify critical uncertainties and knowledge gaps, and provide information necessary to assess habitat health and prioritize conservation actions in the Columbia River estuary and tidewater areas.

The Columbia River estuary and tidally influenced areas serve as important migratory, rearing, and, in the case of certain chum populations, spawning habitat for ESA-listed and non-listed anadromous fish stocks that originate in the Columbia River and Snake River basins. This project will describe the historical and current availability (opportunity) and use of tidewater habitat by different life stages of all anadromous species. Data collection and analysis will be carefully coordinated with LCREP, NMFS, WLC-TRT, ICS-TRT, and other research and management entities active in the lower Columbia River. In particular, we will work closely with the WLC- and ICS-TRTs and regional salmon recovery planning bodies (e.g., Lower Columbia River Fish Recovery Board) to ensure that their information needs are met and that opportunities for review and comment occur on an ongoing basis. All information generated by this project will be shared with interested parties and disclosed to the public in a timely manner.

[1] Lower Columbia Steelhead, Lower Columbia Chum, Lower Columbia Chinook, Upper Willamette Steelhead, and Upper Willamette Chinook.

3.2.14 *Coastal Cutthroat Movements in the Columbia River Estuary (BPA #30009)*

Lead: U.S. Fish and Wildlife Service

This project evaluates the spatial and temporal use of Lower Columbia River habitat by emigrant juvenile and adult coastal cutthroat trout using radio and acoustic telemetry. Specifically, emigrating juveniles (smolts) from Abernathy, Mill and Germany Creeks will be implanted with radio tags and located daily via aerial surveys. Juveniles from the Chinook River will be implanted with acoustic tags and monitored using an array of 36 tethered acoustic receivers in the estuary. Adult cutthroat trout (sexually mature and kelts) will be captured from these four tributaries and implanted with acoustic tags. A reduced acoustic array will be maintained year round to monitor adult movement. This information will be augmented by monthly boat surveys. Where possible, spatial patterns of historical catch data will be reviewed and contrasted with physical parameters generated by the CORIE model of the Lower Columbia River to search for relationships between abundance and hydrology. These data will provide the context in which to gauge how power-associated shifts in the hydrology and ecology of the Lower Columbia River impact cutthroat trout.

3.2.15 *Columbia River Estuary and Columbia River Basin Fish and Wildlife Program Report, 2000*

Lead: Independent Scientific Advisory Board (ISAB), NWPPC

The Northwest Power Planning Council (Council) requested the Independent Scientific Advisory Board (ISAB) to undertake a review of the impacts of estuarine conditions on the Council's mission to "protect, mitigate and enhance fish and wildlife in the Columbia River" as affected by development and operation of the hydroelectric system. The ISAB agreed to undertake the review but cautioned that it was unlikely that it could quantify the impact of changes in the estuary relative to specific program or management actions taken in the upper river. The ISAB could, however, provide a historical perspective and qualitative assessment of impacts, identify potentially useful collaborations, and provide recommendations concerning future efforts needed to more quantitatively address this issue.

While conducting this review, the ISAB became aware that there was extensive overlap between a study by the National Marine Fisheries Service (NMFS) and this ISAB assignment. The ISAB expects the NMFS study will add significantly to an informed response to the Council. Consequently, this report has been prepared as a preliminary reply, with additional detail possibly following publication of the NMFS study.

The ISAB recognizes the limitations of data to directly assess impacts of changes in the estuary on the Fish and Wildlife Program. After our review it is the ISAB's assessment that these changes have been "detrimental" to salmonids and the rebuilding objectives of the Program. This advice is principally based on three major issues:

- The significant loss of peripheral wetlands and tidal channels. These habitats are important to the early rearing, survival and growth of chum salmon, sub-yearling chinook, and smaller coho salmon in other west coast estuaries.
- The extent of change to seasonal flows following development of the hydrosystem. The effects of these changes are closely associated with the impact of the development of the navigation channel. In combination, these developments have resulted in changes to estuarine circulation, deposition of sediments, and biological processes.

- The need for precautionary advice given the current state of most salmonid populations in the Basin, the magnitude of change in the estuary, and the lack of investigations upon which to base alternative advice.

As the Fish and Wildlife Program is developed, the ISAB recommends an aggressive experimental program targeted to reduce the likelihood of prolonged uncertainty about the impact of estuarine conditions. Such a program should incorporate monitoring of the physical environment (such as currently begun via the CORIE program, Oregon Graduate Institute) combined with evaluation of large-scale manipulations of estuarine habitats. The intent of these manipulations would be to study changes presumed to have had negative impacts and to conduct these on a scale that can be measured within the natural environment.

3.2.16 *Columbia River Estuary atlas of Physical and Biological Characteristics*

Lead: Columbia River Estuary Data Development Program (CREDDP), 1984

The Columbia River Estuary Atlas of Physical and Biological Characteristics includes a comprehensive data set of Columbia Estuary ecosystem dynamics. The Atlas was used as an important planning tool for decision makers with a stake in the health of the estuary. The research focused on the linkages among different elements of the food web and the influence on the food web of various physical processes such as current, sediment transport, and salinity intrusion.

3.2.17 *Columbia River Estuary Dredged Material Management Plan, 2001*

Lead: CREST

In 1979, the Columbia River Estuary Study Taskforce (CREST) completed the Dredged Material Management Plan for the Columbia River Estuary. The plan identified 98 dredged material disposal sites, established priorities for their use, and recommended techniques for their protection and control. In 1986, the CREST reevaluated and updated the plan to produce the Columbia River Estuary Dredged Material Management Plan. The objective of this taskforce is to draft a revised and updated Dredged Material Management Plan for the Columbia River Estuary.

3.2.18 *Columbia River Estuary Regional Management Plan, 1979*

Lead: Columbia River Estuary Study Taskforce

This document is the culmination of 4 ½ years of planning by the Columbia River Estuary Study Taskforce (CREST), local jurisdictions, state and federal agencies, and concerned citizens. Impetus for developing the plan came from growing conflicts over use and development of estuarine areas. New environmental protection laws, enacted to preserve rapidly dwindling natural resources, drastically changed the ground rules for development, to the confusion of ports and the private sector. This regional plan was in response to state coastal zone management programs and federal funding under the 1972 Coastal Zone Management Act. The needs for better management data, long term protection to critical natural resource areas, and channel development all contributed to the planning program.

The Columbia River Estuary Regional Management Plan expresses decisions of the CREST Council on estuarine management issues. The plan has no legal authority except as it is implemented by local governments in revised local comprehensive plans (Oregon) and amended

local Shoreline Management Master Programs (Washington). Also, the decisions in the plan do not supercede or negate other management and regulatory authorities, except to the extent provided in state and federal consistency procedures.

The plan includes:

- Summary of Regional Policies
- Management System and Development Standards
- Land and Water Use Plan
- Dredged Material Management Plan
- Restoration and Mitigation Plan
- Plan Implementation

3.2.19 *Columbia River Terminal Fisheries Research Project (CRE Project 9306000)*

Lead: Oregon Department of Fish and Wildife, Clatsop Economic Development Council

The goal of this project is to determine the feasibility of creating or expanding terminal known stock fisheries in the Columbia River Basin to allow harvest of strong anadromous salmonid stocks while providing greater protection of depressed fish stocks. If terminal fishery research proves successful, several benefits are possible: 1. 100-400 percent greater survival of existing hatchery fish when reared/released from net pens. 2. Commercial harvest of hatchery fish with minimal impact on depressed wild runs--fisheries could be 90+ percent ""clean."" 3. Potential for shifting non-Treaty mainstem fisheries to terminal sites allowing much greater escapement of ESA-listed and other stocks.

Project Milestones:

- In 1992, BPA funded 2 year study of overwinter rearing of coho in Youngs Bay net pens, per 1992 NPPC Program.
- In 1993, BPA began 10 year, comprehensive investigation of terminal fishery expansion.
- From l992-l997 this project tested the efficacy of overwinter rearing of coho and spring chinook in Youngs Bay net pens.
- From l995-2003 the plan is to test, rear, and fish in new terminal fishing sites.
- The first year of coho overwinter research returned 33,000 adults to Youngs Bay harvest (2.62% survival) in 1994.

3.2.20 *Columbia River Channel Improvements Project Biological Assessment*

Lead: US Army Corps

The U.S. Army Corps of Engineers (Corps) has prepared this Biological Assessment (BA) for the Columbia River Channel Improvements Project (the Project) to evaluate potential effects on federally listed threatened and endangered salmonids that may be associated with proposed channel improvements1.

In December 1999, Congress authorized the deepening of the Columbia and Lower Willamette Rivers Federal Navigation Channel to 43 feet. The authorized plan would modify the

existing federal navigation project for the Columbia and Willamette Rivers and provide for construction of ecosystem restoration features.

This BA is for the Columbia River segment of the authorized project only. This BA was prepared as part of the biological consultation required under Section 7 of the Endangered Species Act (ESA). This reconsultation process was undertaken with the U.S. Fish and Wildife Service (USFWS) and the National Marine Fisheries Service (NMFS).

The location of the proposed project activities will be limited to dredging selected areas; disposing of dredged material in selected pre-approved upland and shoreline locations; and disposing of dredged material in selected flowlane and ocean locations.

Ecosystem restoration features identified as part of the authorized Project include the use of a combined pump/gravity water supply for restoring wetland and riparian habitat at Shillapoo Lake (RM 91); tidegate retrofits for salmonid passage installed at selected locations along the lower Columbia River; and construction of connecting channels at the upstream end of Walker-Lord and Hump-Fisher Islands to improve access to embayments and rearing habitat for juvenile salmonids.

Environmental mitigation features proposed to offset wetland and riparian losses resulting from upland disposal are also included in the authorized project.

3.2.21 *Comprehensive Conservation and Management Plan (CCMP) for the Lower Columbia River, 1999*

Lead: LCREP

The Comprehensive Conservation and Management Plan serves as the strategic plan for the Lower Columbia River Estuary Partnership. It guides all program activities and annual work tasks for the Partnership. Developing and implementing a Comprehensive Conservation and Management Plan is the primary task of a National Estuary Program.

The Management Plan goals are:

- Increase habitat and habitat functions
- Prevent toxic and conventional pollution
- Improve land use practices to protect ecosystems
- Monitor the river for long term and evaluate impact of actions
- Strengthen coordination between the states in water quality and species issues
- Enhance education opportunities about the lower river and estuary to build stewardship among all citizens: individual, municipal, corporate
- The Lower Columbia River Estuary Partnership provides an Actions Status Report for it's Management Plan every 2 years. The most recent report was issued in July, 2003.

3.2.22 *Conservation Partnership: National Performance and Results Measurement System*

Lead: Natural Resource Conservation Service (NRCS)

The Conservation Partnerships in Oregon and Washington are a unique coalition of local, tribal, state and federal groups that mobilizes staff and program funding to help people and communities address natural resource conservation issues. Relying on mixed expertise, authorities, and the common sense each member organization brings to the table, the Partnership strives to realize a shared vision – local people making informed decisions for healthy and economically viable lands.

Natural Resource Conservation Service (NRCS) and the rest of the conservation partnership use the National Performance and Results Measurement System (PRMS) to report conservation progress on private lands. PRMS is not complete for SWCDs and other conservation partners to enter all their accomplishments so the following report underestimates total accomplishments of the partnership. Nationally, state and local options are being added to PRMS which will improve its capability to capture total accomplishments.

During federal fiscal year 2000, over 2,100 acres of resource management systems (RMS) were planned and almost 1,600 acres applied in the lower Columbia and Columbia estuary subbasins. These RMSs benefit fish, wildlife, water quality and overall watershed health by reducing erosion, controlling non-point source pollution and restoring riparian and upland wildlife habitat.

Conservation Planning & Implementation

Lead: East Multnomah SWCD

This proposal is for continuation of an earlier OWEB-funded project. It focuses on providing landowners with technical assistance to develop site-specific conservation plans and installing conservation practices. OWEB funds are requested for personnel, travel, training, supplies, operations, administration and site monitoring for five years.

3.2.23 *Consideration of Ocean Conditions in the Management of Salmon*

Lead: Bisbal and McConnaha, 1998

This paper presents and ecologically based conceptual foundation as a way to incorporate environmental variability in salmon management. The argument addresses the problem of accommodating marine environment variability through actions in freshwater. The paper argues for an approach that considers marine and freshwater environments as integral components of a larger salmonid ecosystem. This contrasts with previous propositions that either relied heavily on technological fixes in the freshwater environment or questioned the value of any recovery effort designed to withstand overwhelming ocean forces. Salmon management requires a more holistic approach incorporating modern understanding of the salmonid ecosystem and its variability.

The paper suggests two strategies. The first calls for deliberate improvement of estuarine and nearshore ocean conditions through regulation of upstream flows, river operations, hatchery production, and other actions. The second calls for improving the resilience of salmon to a variable environment. This requires relaxing anthropogenic factors that hinder the natural range of salmon life history diversity within and between populations, a survival mechanism that evolved in response to changing conditions. These strategies recognize that although the ocean primarily determines overall salmon abundance, management actions, particularly in freshwater, are critical to the ability of salmon to cope with a variable ocean environment.

3.2.24 *Ecology of Bald Eagles on the Lower Columbia River, Oregon State University, 1988*

Lead: Oregon State University

This report provides information regarding diet, management implications and environmental contaminants impacting bald eagles on the lower Columbia River. The major limiting factors included in this report include:

- Declines of bald eagles are due to environmental contaminants including DDE, DDD, hexachlorobenzene, mirex, PCBs, mercury, cadmium and lead.
- Declines in raptor populations have been associated with eggshell thinning induced by the DDT-metabolite DDE (Newton 1979:239).
- Contaminants entering the Columbia River system have an effect on the population.
- The Columbia River acts as a sump for many kinds of contaminants including PCBs.

3.2.25 *Ecology of Marine Predatory Fishes: influence on Salmonid Ocean Survival*

Lead: U.S. National Marine Fisheries Service, 1998 to present

This project, supported by BPA, characterizes, over a 5-year period, the temporal and dynamic nature of the marine fish community off the Columbia River during the spring-summer

transition (peak salmonid migration period) and relate dynamics in this marine fish community with salmonid survival.

A primary focus will be identification of the strength of trophic linkages between forage and fish predator species, and the influence of these relationships on predation rates on juvenile salmon. To identify if large marine fishes are a major source of salmon smolt mortality, the project will collect predatory and forage fishes off the mouth of the Columbia River, estimate their abundance, and determine predatory fish feeding habits. Sampling will be conducted from late April to June when juvenile salmon begin outmigration into the nearshore ocean environment. A representative sample of these large marine fish predators will be identified, measured, weighed, and their stomach contents retained for analysis.

The project will also assess ocean water conditions (salinity, temperature, and chlorophyll a). These data will be used to estimate the relationship between the marine fish community structure and juvenile salmon consumption rates in the nearshore ocean adjacent to the Columbia River and begin to describe the environmental factors that influence this predation.

3.2.26 *Ecosystem Restoration Plan With Emphasis on Salmonids in the Columbia River Estuary (RPA 159 Plan)*

Lead: US Army Corps of Engineers

Habitat restoration in the Columbia River estuary (CRE) is an important off-site mitigation action in the 2000 Biological Opinion (BiOp), an operation of the Federal Columbia River Power System. In response to the decline in available habitat, the BiOp's Reasonable and Prudent Alternative (RPA) included mandates to "…develop a plan addressing the habitat needs of juvenile salmon and steelhead in the estuary" (RPA Action 159) and "…develop and implement an estuary restoration program with a goal of protecting and enhancing 10,000 acres of tidal wetlands and other key habitats…" (RPA Action 160). To meet Action 159 and support Action 160, this document develops a science-based approach designed to improve ecosystem functions through habitat restoration activities in the CRE.

The CRE habitat restoration program's goal and principles focus on habitat restoration projects in an ecosystem context. The program's goal is: Implementation of well-coordinated, scientifically sound projects designed to enhance, protect, conserve, restore, and create 10,000 acres of tidal wetlands and other key habitats to aid rebuilding of ESA-listed salmon populations and native species using the CRE.

The intent of this document is to provide a scientific basis and implementation guidelines for a habitat restoration program designed to improve ecosystem functions and enhance juvenile salmonid survival in the CRE. The approach advocated in this document may be summarized in the following sequence of steps.

- Describe the fundamentals of restoration science.
- Determine usage of CRE habitats by salmonid life history type, i.e., determine which habitats are most important and why
- Determine what CRE habitats have been lost relative to historical conditions (predevelopment in 1900s).
- Identify and prioritize restoration strategies for the CRE and establish a reasonable future condition, given constraints on the system (e.g., flow regulation).

- Determine what specific habitats can be restored and where, i.e., develop an inventory of possible actions.
- Implement locally supported and scientifically based restoration projects.
- Monitor actions using standardized protocols and apply the results to adaptively manage future restoration actions.

3.2.27 *Effectiveness Monitoring of the Chinook River Estuary Restoration Project (BPA #3006)*

Lead: Sea Resources

This project will design and implement a long-term monitoring and evaluation plan to investigate salmon responses to the Chinook River estuary restoration project. It will establish a pre-restoration baseline condition of existing estuary use by juvenile salmon as well as monitor certain habitat attributes. This project will continue to monitor these parameters after the restoration project is completed in order to complete pre and post project comparative analyses. It will use a variety of capture and marking techniques to determine abundance and length of residency of salmon in the Chinook River estuary. This project will also implement a concurrent habitat monitoring component to measure specific habitat attributes by installing five data loggers for continuous monitoring of temperature, salinity, dissolved oxygen and tidal stage.

Since little is known about the ecological importance of the estuary for Columbia River salmon, current restoration plans in the estuary are based on inferences from studies in other watersheds. Therefore, it is important that any early restoration projects in the Columbia River estuary be carefully monitored in order to evaluate salmon responses to estuary restoration. The Chinook River estuary restoration project offers an excellent opportunity to answer some of the uncertainties regarding estuary restoration and salmon recovery.

3.2.28 *Endangered Species Act 2004/2004-2008 Implementation Plan for the Federal Columbia River Power System*

Lead: USACE, US Department of the Interior Bureau of Reclamation, BPA

This *2004/2004–2008 Implementation Plan* is the third issued by the Action Agencies and builds on the lessons from their first three years of BiOp planning and implementation. The Action Agencies are again issuing this year's one- and five-year implementation plans as a single combined document. The following is an overview of sections included in this document:

Section 1.0–Overview

Describes the context for the Action Agencies' five- and one-year implementation plans, the structure of this year's document and a summary of shifts from prior implementation plans.

Section 2.0–Goals

Identifies the goals derived from the "All-H Strategy" and evaluated using established performance standards.

Section 3.0–Performance Measures and Standards

Describes the performance standards and measures, or metrics, that will be used to determine success of implementation actions. Proposed changes to the performance standards and measures are also explained.

Section 4.0–Strategies to Achieve Recovery

Describes the Action Agencies' strategic approach for coordinating and implementing fish recovery efforts over the life of the BiOps.

Section 5.0–Priorities, Work Plans and Outcomes (2004–2008)

Details the Action Agencies five-year outcomes and one and five-year work plans for BiOp implementation. The five-year portion serves as a "big picture" blueprint that organizes collective efforts by the three Action Agencies to achieve certain outcomes by 2008. The one-year portion provides a more detailed description of implementation measures planned for the upcoming fiscal year (October 2003 to September 2004). The work plans describe the specific tasks that need to be accomplished to achieve the identified outcomes.

Section 6.0–Coordination Forums

Describes the regional forums and other entities with which the Action Agencies coordinate fish recovery measures.

Appendix A–Project Tables (separate document)

Lists of specific projects the Action Agencies propose to implement from 2004 to 2008, based on the listed ESUs and H-categories, respectively. New and ongoing actions planned for implementation by the Action Agencies are included. Further project level detail is available to NOAA Fisheries and USFWS on request.

As expected, the implementation plans are dynamic and will continually evolve as information and experience advance. Each year, new implementation plans and a progress report will be issued and will inform NOAA Fisheries' annual Findings Letter. Each year, the plans will be further refined as progress and results are reported. Future updates to the plans will reflect new information, including recommendations from the fish recovery planning processes or input received through the regional coordinating forums.

3.2.29 *Endangered Species Management Plans for Lower Columbia Coho Salmon*

Leads: Oregon Department of Fish and Wildlife, Oregon Department of Forestry, Oregon Department of Transportation, Division of State Lands, Oregon Parks and Recreation Department, Oregon Water Resources Department.

The Oregon Fish and Wildlife Commission (OFWC) listed lower Columbia River wild coho salmon as an endangered species in July 1999. Under provisions of Oregon's threatened and endangered Species law, state agencies that have a conservation role must prepare an endangered species management plan and have this plan approved by the OFWC by July 2001.

Agencies that have produced endangered species management plans are: ODFW, ODF, DSL, WRD, OPRD, ODOT.

These plans address the key elements as described by OAR 635-100-0140, section 6. Those elements include:

- Land covered in the plans
- The role that land will play in conservation of the species
- How the agency will manage that land
- Monitoring
- Schedule for subsequent reviews

- Relationship to other state and federal plans
- Process used to develop plans

3.2.30 *ESA Salmon Recovery Planning*

Lead: Multiple agencies

Chinook and chum salmon, steelhead, and bull trout in the lower Columbia have been listed as threatened under the ESA. As the listing agency under the ESA, NOAA Fisheries (NMFS) is responsible for developing plans to recover chinook and chum salmon and steelhead. The US Fish and Wildife Service (USFWS) is responsible for developing a bull trout recovery plan.

NOAA Fisheries Recovery Planning

The basic unit used by NMFS for listing and delisting salmonid species is the Evolutionarily Significant Unit. An ESU is a distinctive group of Pacific salmon, steelhead, or sea-run cutthroat trout that is uniquely adapted to a particular area or environment and cannot be replaced. In the lower Columbia region of Oregon and Washington, there are three ESUs: Chinook River chum salmon; Lower Columbia Steelhead; and Lower Columbia chinook salmon.

A recovery domain is a collection of geographically proximate ESUs. The Willamette/Lower Columbia Domain includes the three lower Columbia ESUs and two Willamette ESUs. NMFS has initiated efforts to develop a single recovery plan for the Willamette/Lower Columbia Recovery Domain.

NMFS desires to develop this domain recovery plan through a collaborative effort involving federal and state agencies, tribes, local governments, and the public. Under the proposed approach, the recovery plans being developed in Washington and Oregon for the lower Columbia ESUs will be combined with the recovery plans being developed for the Willamette ESUs to create a single domain plan. The Willamette/Lower Columbia ESA Executive Committee is coordinating the overall domain planning effort and will ensure 1) that the separate Oregon and Washington planning efforts are consistent and compatible, and 2) that they will result in a domain plan that meets ESA requirements. The committee comprises policy-level representatives from federal agencies, tribes, Washington and Oregon agencies, and local governments.

The LCFRB is coordinating the Washington recovery planning efforts for the lower Columbia. The LCFRB recovery/subbasin plan will be incorporated in the Willamette/Lower Columbia Domain Plan. It is expected that NMFS will approve the LCFRB plan as the ESA recovery plan for those areas of the three listed lower Columbia ESUs in Washington, even if Oregon has not completed its plan for the Oregon portions of the ESUs.

NMFS also has established the Willamette/Lower Columbia Technical Recovery Team (TRT) to provide technical advice on recovery-related issues. The TRT comprises scientists from NMFS, state agencies, academic institutions, and private consulting firms. The TRT has focused on developing guidelines for viability criteria for the listed species. These guidelines will assist NMFS in identifying criteria for delisting species. These criteria will describe the conditions under which a listed species or ESU is no longer in danger of extinction (endangered) or likely to become so in the foreseeable future (threatened).

US Fish and Wildlife Recovery Planning

Bull trout was listed as threatened in the coterminous United States in November 1999. In December 1999, USFWS completed a draft bull trout recovery plan for five western states—Washington, Oregon, Idaho, Montana, and Nevada. The plan is broken down into four Distinction Population Segments. Each Distinct Population Segment is broken into recovery units and mini-recovery plans have been developed for each recovery unit. Much of the USFWS Lower Columbia Recovery Unit falls within the LCFRB planning area.

The objectives of the draft USFWS bull trout plan are to:

- maintain the current distribution of bull trout within core areas and to restore distribution where possible
- maintain stable or increasing trends in bull trout abundance
- restore and maintain suitable habitat conditions for all bull trout life history stages
- conserve genetic diversity and provide opportunity for genetic exchange

The recovery planning process being coordinated by the LCFRB will build on the provisions of the USFWS Lower Columbia Recovery Unit plan to refine bull trout recovery strategies for the lower Columbia and will ensure that bull trout recovery efforts are woven into the broader salmonid recovery strategies and actions for the lower Columbia.

State Recovery Efforts

Some states have developed their own management and recovery plans for Columbia Basin fish and wildlife resources. Coordination with basinwide recovery efforts is ensured through participation of key state representatives in regional groups.

The Oregon Plan for Salmon and Watersheds is the state framework for implementing state activities that benefit listed fish within the Oregon portion of the river basin. Success depends on implementing and integrating four key parts of the plan— agency actions, voluntary restoration actions, monitoring, and science oversight—that together provide innovative solutions to support recovery of native fish, improve water quality and restore watersheds.

Washington's 1998 Salmon Recovery Planning Act provided the framework for developing and funding habitat protection and restoration projects. The Statewide Strategy to Recover Salmon guides programs to improve the habitat of listed species and assist in recovery planning.

Estuarine Habitat and Juvenile Salmon – Current and Historic Linkages in the Lower Columbia River and Estuary

Leads: NMFS, USACE, University of Washington, ODFW, WDFW, and the Oregon Graduate Institute, 2000-present

This is a study to identify important estuarine habitats and to evaluate the role of the Columbia River estuary to juvenile salmon. The approach will be to 1) determine the relationship between habitat and the presence, use, and benefit to juvenile salmon, with an emphasis on subyearling chinook salmon, in the lower Columbia River and estuary and 2) understand change in flow, sediment input, and availability of habitat in the lower Columbia River and estuary.

A modeling effort to evaluate the impact of physical change (natural and anthropogenically-induced variability) on the availability of critical salmon habitat is planned as part of the study. To accomplish this objective, researchers plan to use the CORIE numerical modeling system for the lower Columbia River and estuary. This modeling system is being independently developed and validated. It will be used here to evaluate availability of habitat affected by variation imposed by both natural processes and anthropogenic manipulation of the system and further, to a limited extent, associations between salmon use and habitat type.

3.2.31 *Estuarine Habitat Restoration/Reconnection of Clatskanie River*

Lead: Lower Columbia Watershed Council

This project would breach a 110-foot long dike on the Clatskanie River that currently joins Anunde Island with the mainland, thus restoring the free flow of water through the historic side channel, and stabilize and re-vegetate the newly exposed surfaces.

3.2.32 *Evaluation of Live Capture Selective Harvest Methods for Commercial Fisheries on the Columbia River, 2001. (Lcr 200100700)*

Lead: Oregon and Washington Departments of Fish and Wildlife

The primary goal of this ongoing project is to develop, evaluate, and implement commercial live capture, selective harvest methods in the Lower Columbia River. The states' intent is for commercial fishers to contribute to the conservation of depressed or listed species by selectively harvesting fish from strong stocks, while releasing those from weak stocks live and unharmed to continue their upstream migration.

Studies concerning live capture commercial fishing gears and methods were initiated with an Oregon Department of Fish and Wildlife (ODFW)-funded pilot project in 2000 and expanded with Bonneville Power Administration (BPA)-funded projects in 2001 and 2002. Since 2000, a significant amount of knowledge has been gained from these projects. Data collected and analyzed is providing guidance regarding live capture commercial fishing gears and methods. Additionally, a once skeptical commercial fishing industry has become supportive of efforts to institute live capture commercial fisheries in the lower Columbia River.

Results to date indicate that small mesh gear is effective at allowing high survival rates for spring chinook handled; however, results to date also raise concerns as to the handle of non-target species, especially winter steelhead. In response to results to date this proposal in focussing primarily on mesh size studies to identify the appropriate gear to harvest hatchery spring chinook while reducing handle of and impact to winter steelhead.

3.2.33 *Evaluation of Spawning for Fall Chinook and Chum Salmon Just Below the Four Lower Most Columbia River Dams, 1999-2001 (BPA # 1999-003-001)*

Lead: Washington Department of Fish and Wildlife

Fish and Wildlife Program funding for this project began in October 1998 (Fiscal Year 1999). The project is composed of three closely related activities. Pacific States Marine Fisheries Commission (PSMFC) is leading the adult studies portion, ODFW is leading the juvenile studies portion, and the U.S. Fish and Wildife Service (USFWS) is leading the habitat assessment portion of the project.

ODFW and PSMFC have conducted chum salmon spawning ground surveys from The Dalles Dam downstream to the estuary, and are scheduled to continue those surveys. These two Agencies also began adult and juvenile studies in the Ives/Pierce Island complex in 1998, and those studies are also ongoing. USFWS began habitat assessment studies in 1998 and were joined by the U.S. Geological Survey (USGS) and Pacific Northwest National Laboratories (PNNL) in 1999. Habitat assessment studies are ongoing downstream from Bonneville Dam. PNNL is also assisting with portions of the adult and juvenile studies. Adult, juvenile, and habitat studies are designed to be complementary to achieve the purposes of this project, and each lead Agency is responsible for their respective objectives based on their special skills, knowledge, and experience in those areas.

3.2.34 *Expedited Reconnaissance Study 2001*

Lead: Army Corps of Engineers

This feasibility study, authorized by a resolution of the Senate Committee on Environment and Public Works, investigates and recommends appropriate solutions to accomplish ecosystem restoration in the lower Columbia River and estuary, including wetland/riparian habitat restoration, stream and fisheries improvement, water quality and water-related infrastructure improvements.

3.2.35 *Franz Lake National Wildlife Refuge*

Lead: USFWS, Franz Lake National Wildlife Refuge

The Franz Lake National Wildlife Refuge is part of the Ridgefield National Wildlife Refuge in southwest Washington. It contains more than 500 acres of river bottomland and upland riparian habitat with numerous springs, seeps and creeks, grasslands, hardwood and upland forests. Franz Lake is one of the few remaining natural wetlands in the Columbia River Gorge. The refuge provides critical wintering habitat for tundra swans and other waterfowl and year-round habitat for a variety of wildlife species.

The refuge development and management efforts aim to:

- Maintain a native diversity of wetland habitats for breeding/migrating/wintering waterfowl and other aquatic migratory birds, with a special emphasis on tundra swans.
- Provide and enhance habitat for endangered, threatened and sensitive species.
- Enhance wildlife diversity through habitat management.
- Restore natural, dynamic stream/river systems, including their associated in-water and riparian habitats for anadromous fish, breeding neotropical birds and other native fish and wildlife.

- Provide opportunities for quality, wildlife-dependent recreation, education and research to enhance public appreciation, understanding and enjoyment of refuge fish, wildlife and habitats.
- Preserve designated cultural resources.

The Ridgefield National Wildlife Refuge Complex is comprised of five refuges located in the southwest part of the state of Washington: Ridgefield north of Vancouver; Conboy in the southcentral part of the state; and Franz Lake, Pierce and Steigerwald Lake all located in the Columbia River Gorge.

3.2.36 *Gourlay Creek Fish Passage and Fish Habitat Project (LCR Project 200103800)*

Lead: City of Scappoose, Oregon

This project consists of planning, design and construction of a fish passage (ladder) facility in Gourlay Creek and would include an initial 3-year monitoring element as well as longer term fish and flow monitoring.

The project would open up over 2 miles of habitat for ESA candidate species (Coho and cutthroat trout) and nearly 4 miles of habitat for ESA listed steelhead. The City of Scappoose owns and manages close to half of the Gourlay Creek Watershed including high quality habitat above and below the Gourlay Creek Dam. Gourlay Creek is also one of the City's municipal watersheds. The City of Scappoose, the Scappoose Bay Watershed Council (SBWC), local residents, local high school kids, OR Dept. of Fish and Wildlife, OR Trout, OR Dept. of Forestry, Olympic Resources (local timber company), OR Dept. of Water Resources, Bonneville Power Administration, and OR Department of Environmental Quality have undertaken assessment and restoration work in the SBW and Gourlay Creek watersheds. These efforts demonstrate both the ecological importance of the watershed and the significance of addressing the fish barrier problems.

There is a continued high level of support and interest in conserving and restoring salmonid habitat in the Gourlay Creek Watershed. The City has worked with the SBW council for the past 3 years monitoring water quality on Gourlay Creek and over the past 2 years has undertaken extensive assessment and begun restoration work with ODFW, the SBW council, and other watershed partners. The City of Scappoose is also in the process of developing a long-term management plan for City forestlands in the watershed. The Gourlay Creek Fish Passage and Fish Habitat Project is a major piece of the overall fish conservation and restoration efforts in the watershed. Ongoing and proposed fish monitoring efforts will help ensure that the effectiveness of the project and provide a basis for adaptive management in the watershed.

Gourlay Creek Dam is a key limiting factor in the re-generation of salmon and trout in the Gourlay Creek watershed. Currently it provides a complete barrier to fish passage to ESA listed salmonids as well as to salmonids that are under status review for ESA listing. Historically, Gourlay Creek has provided important salmonid habitat within the Scappoose Bay Watershed (SBW). Salmonids still utilize the lower reaches of Gourlay Creek.

3.2.37 *Habitat Criteria Summary/Workshop Outcomes, Lower Columbia River (Draft)*

Leads: CREST, LCREP, Army Corps of Engineers, and American Rivers, 2001

This workshop was convened in Astoria, Oregon, in June, 2001, in order to address the need of resource managers for a scientifically acceptable approach to making decisions regarding projects that impact habitat or affect the protection and restoration of habitat. With the limited knowledge that is available, it is important that projects that have the highest probability of success are identified and implemented and then monitored carefully with appropriate control sites so that an adaptive approach to habitat protection and restoration can be instituted.

The workshop focused on developing scientific criteria for identifying and prioritizing habitat protection and restoration projects on the lower Columbia River. Over one hundred national and regional experts and agency resource managers met for the intensive two-day session. Workshop participants reviewed available information on lower Columbia River ecological processes, particularly those related to salmonid use, and distilled that information through a series of workgroup sessions into a set of draft habitat restoration and protection criteria. The draft criteria represent a set of scientifically educated guesses about where to focus restoration and protection activities in the lower river.

The criteria developed at the workshop were the first step in a process that will ultimately lead to a institutionalized process for selecting habitat projects that are both scientifically sound and contribute to the protection and restoration of salmon and other native species. The Lower Columbia River Estuary Partnership Science Work Group and a select group of workshop participants are engaged with agency scientists and policy makers in refining the criteria and coordinating application of the habitat restoration criteria and priorities into on the ground projects.

3.2.38 *Habitat Restoration Site inventory 2001*

Leads: Lower Columbia River Estuary Partnership, Columbia River Estuary Study Taskforce

Building on past restoration planning activities, CREST and LCREP continues to expand its spatially referenced habitat database identifying potential habitat restoration, protection, and enhancement opportunities in the Lower Columbia from the mouth of the Columbia to Bonneville dam. The data gathered to this point is iterative and interactive to include more site-specific conditions and reflect changes in restoration planning strategies. The database serves as the first “crack” at a comprehensive restoration strategy for the Lower Columbia.

3.2.39 *Habitat Restoration Program (LCREP, 2004)*

The mission of the Lower Columbia River Estuary Partnership’s proposed Habitat Restoration Program is to implement and monitor strategic, well-coordinated, scientifically sound projects designed to rehabilitate, enhance, protect, conserve, create, and restore 16,000 acres tidal wetlands and other key habitats to support native species using the Lower Columbia River estuary from the river’s mouth to Bonneville Dam, with a special emphasis on ESA listed species, and other focal species described in the Comprehensive Conservation Management Plan and the sub-basin plan. The following four goals are contemplated:

- Map, quantify, and compare the pre-twentieth century and current aquatic habitats of the estuary. The historic condition of the estuary provides an important template for restoration planning. It indicates where habitats used to occur, their natural, size, shape, community composition, and connectedness to other elements of the ecosystem. How much of various habitat types were present, where were they located, how were they organized/arranged, and their geomorphology are all important considerations. Fulfilling this goal will allow us to understand how the estuary aquatic habitats have changed and use data on previous

presumably productive habitat conditions to guide the project selection process. This goal is currently included in LCREP's proposed habitat restoration program.

- Establish goals, objectives, and scientific principles for restoration in the estuary. This goal provides a scientific basis for restoration using the best available research data in the context of the mission and specific program objectives Efforts will be undertaking to identify locations where carefully targeted restoration activities should be undertaking where there is high confidence in their ecological benefits and success, and where there is a high likelihood that they will enhance our understanding about how to restore the estuary. Sequencing and prioritizing actions will depend upon the results of earlier actions and unpredicted changes occurring in the landscape.
- Establish a program infrastructure including a framework for soliciting, developing, selecting, and funding priority restoration projects.
- Establish habitat monitoring program. Monitoring is a critical component of ecosystem recovery planning. Monitoring designs are intended to provide high quality data on the restoration of the Estuary, including how it works, how it responds to changes (our actions), and how well we are able to predict what we think is going to happen. Monitoring activities include specific projects designed to gather project-specific data, efforts to assess restoration progress on a regional scale, and projects to continue the collection of long-term trend information for species, habitats, and hydrologic data. Monitoring is intended to provide information that is integrated into an adaptive management process.

3.2.40 *Historic Habitat Opportunities and Food-Web Linkages of Juvenile Salmon in the Columbia River Estuary and their Implications for Managing River Flows and Restoring Estuarine Habitat (BPA #30001)*

Lead: Northwest Fisheries Science Center, National Marine Fisheries Service

This project addresses specific information needs identified in a recent interdisciplinary assessment of the hydroelectric system's impacts on estuarine habitat conditions for juvenile salmon. The primary elements of this project include: (1) retrospective analyses to reconstruct historic bathymetric features and assess effects of climate and river flow on the extent and distribution of shallow water, wetland and tidal-floodplain habitats; (2) computer simulations using a 3-dimensional numerical model to evaluate the sensitivity of salmon rearing opportunities to various historical modifications affecting the estuary (including channel changes, flow regulation, and diking of tidal wetlands and floodplains); and (3) life-history specific information based on present and historic food web sources as determined by stable isotope, microchemistry, and parasitology techniques. From these data and additional modeling simulations selected during an estuarine habitat restoration workshop, this project (4) examines effects of alternative flow-management and habitat-recovery scenarios on habitat opportunity and the estuary's productive capacity for juvenile salmon.

The Columbia River estuary serves as an important migration, rearing, and transition environment for juvenile anadromous salmon before they enter the sea. Historical modifications to the estuary, including diking of peripheral wetland and floodplain habitats and regulation of river flows by dams, have reduced salmonid access to shallow rearing habitats and may have eliminated sources of macrodetritus that fuel the estuary's food webs. Although there is emerging evidence that these estuarine changes are limiting juvenile salmon production and life history diversity, lack of information about historic and modern habitat conditions in the estuary,

or the ecological consequences of habitat change, undermine existing salmon recovery efforts of the Columbia Basin Fish and Wildlife Program.

3.2.41 *Historical Population Structure of Willamette and Lower Columbia River Basin Pacific Salmonids*

Lead: NMFS Northwest Fisheries Science Center, WA Department of Fish and Wildlife

In 2000, the Population Identification Subcommittee of the Willamette/Lower ColumbiaTechnical Recovery Team (WLC-TRT) convened to review information relevant to the identification of historical, demographically independent populations of chinook salmon (Oncorhynchus tshawytscha), chum salmon (O. keta), and steelhead (O. mykiss) within their recovery domain. This document presents the preliminary conclusions of the subcommittee.

The historical population boundaries and designations provided are intended to be representative of the range and diversity of populations for each species in the listed evolutionarily significant units (ESUs), not necessarily an exact reconstruction. Furthermore, the population boundaries presented delimit the basin area used by spawning adults from each population. It is understood that many of the populations share areas for juvenile rearing, migration corridors, and ocean feeding.

The Willamette/Lower Columbia Technical Recovery Team's (WLC-TRT) goal is to identify historical and extant independent populations of salmonids in listed evolutionarily significant units (ESUs).

The populations ultimately identified are the demographically independent units for which viability will be estimated. These populations are the independent groups of fish whose historical and present condition will be characterized in future papers. For each population, we will describe numbers and productivity of salmon, life-history and phenotypic diversity, and spatial distribution of spawning and rearing groups. In addition, we will estimate the habitat capacity for each population under historical and present conditions. In the ultimate recovery goals expressed, the populations identified in this document will be those considered when answering the question: "How many and which populations are necessary for the persistence of the ESU?"

Implementation of the Habitat Restoration Program for the Columbia Estuary and Lower Columbia River (BPA # 30016)

Lead: Lower Columbia River Estuary Partnership and Columbia River Estuary Study Taskforce

This project establishes a program to identify and prioritize on-the-ground habitat restoration projects and plan their monitoring and evaluation. It takes action on six restoration projects already processed and approved through regional and local workgroups.

Efforts to protect existing habitat and restore altered habitat have been initiated and a long-term action plan developed. The work to be accomplished under this project will continue to institutionalize this effort as it implements the habitat restoration program for the long-term and takes action on beneficial, already-scrutinized habitat restoration projects in the short-term (three years). The outcome of this project will be increased survival of juvenile salmonids.

Restoration of habitat for juvenile salmonids migrating through the Lower Columbia River (below Bonneville Dam) and the Columbia Estuary is an important component of regional recovery plans. The lower river and estuary are critical areas in the migration corridor for Columbia Basin anadromous fish, especially ocean-type listed as Threatened or Endangered, because they provide refugia from predators, feeding grounds, and areas to transition physiologically from freshwater to saltwater. However, over the last 100 years, the amount of available wetland habitat in this region has decreased by about 75% over historical levels because of dike and levee building, hydrosystem operations, and other activities.

3.2.42 *Independent Multidisciplinary Science Team (Imst) Report on the Recovery of Wild Salmonids in Western Oregon Lowlands*

Lead: Independent Multidisciplinary Science Team (IMST), Oregon Plan for Salmon and Watersheds, 2002

This report discusses major characteristics of western Oregon's lowland rivers, streams, and estuaries that the IMST finds to be important to wild salmonids. It describes how landscape scale factors – landscape structure, landscape function, disturbance regimes, and landscape scale biological processes – historically supported salmonid populations in western Oregon lowlands. The report also covers human modifications to these ecosystems that impact salmonids. It assesses how lowland land use practices may have altered lowland systems so that the landscape's ability to support healthy salmonid populations was reduced. Finally, it discusses how functioning lowland ecosystems might be protected and restored.

The geographic scope of this report is the lowland portion of Oregon west of the crest of the Cascade Range.

3.2.43 *independent Populations of Chinook, Steelhead, and Sockeye wor Listed Evolutionarily Significant Units within the interior Columbia River Domain*

Lead: Interior Columbia Basin Technical Recovery Team

In this document, the Interior Columbia River Basin Technical Recovery Team provides the background, analysis, and recommendations on the identification of independent populations of the seven Evolutionarily Significant Units (ESUs) of anadromous salmonids listed under the Endangered Species Act in this recovery domain.

We describe current population structure in the seven listed salmonid ESUs in the interior Columbia Basin. In addition, we review historical documentation and describe likely differences

in population structure prior to major anthropogenic manipulation of the region. The populations identified in this document are the independent groups of fish for which we will assess status and establish viability goals in future reports.

We examined an array of indicators to assess the independence of populations, including: (1) genetic information, (2) geography; (3) life-history traits, (4) morphological traits, and (5) population dynamics. As putative demographically independent units, these main populations become the focus of recovery planning and conservation efforts in the interior Columbia River basin. These delineations will necessarily play an important role in establishing viability goals at both the population and ESU level.

Our delineations of extant populations include the following:

- Snake River spring/summer chinook ESU: 31 populations
- Upper Columbia spring chinook ESU: 3 populations
- Snake River Fall chinook ESU: 1 population
- Snake River steelhead ESU: 25 populations
- Upper Columbia steelhead ESU: 3 populations, and 1 of ambiguous status
- Mid-Columbia steelhead ESU: 17 populations
- Snake River sockeye: 1 population

We also identified historic populations within current ESU boundaries, and discussed large areas currently blocked to anadromous passage. Finally, we describe data needs that would improve population delineation efforts.

3.2.44 *Iinteragency-ODFW Fish Passage*

Lead: ODFW

The Fisheries Restoration and Irrigation Mitigation Act of 2000 (FRIMA) (PL 106-502) created this federal partnership fish screening and passage program in Idaho, Oregon, Washington and western Montana administered by the U.S. Fish and Wildife Service (USFWS). The purpose of this program is to match federal funds with local, state, and tribal programs to increase fish survival, reduce entrainment in existing water distribution systems, and increase access to productive fish habitat.

3.2.45 *Interim Report on Viability Criteria for Willamette and Lower Columbia Basin Pacific Salmonids*

Lead: Willamette/Lower Columbia River Technical Review Board

This document presents the WLC-TRT's viability criteria guidelines. In approaching the development of criteria for delisting ESUs, the TRT relied on the language in the ESA, information described in the listing decision, concepts outlined in a report on viable salmonid populations by McElhany et al. (2000), and in published research describing salmon populations and their past or potential responses to changes in climate and ocean conditions (e.g., Bradford and Irving 2000).

In considering how viability criteria might inform population delisting requirements, the TRT considered all five of the factors for decline identified by the NMFS. The TRT approach evaluates the extinction risks facing an ESU by assessing the viability of the individual populations within that ESU. The TRT identified population-level viability criteria based on:

- a combination of the four population parameters identified in the VSP document – productivity, abundance, spatial structure, and diversity;
- information about the habitat requirements of the listed salmon; and
- the need to separate population responses to freshwater and estuarine habitat conditions from population responses to fluctuating marine and climatic conditions.
- Building from these population-level criteria, the TRT developed a framework to estabish ESU viability criteria.

3.2.46 *Johnson Lake Revegetation Projects*

Lead: City of Portland

By planting native species and managing invasive species, WRP will restore wetland forest on the 13.2 acre Johnson Lake site, including .4 mile of lake shore and .7 mile of slough channel bank. The 8.5 acre Hayden Meadows project will replace Himalayan blackberry with native riparian vegetation, including .45 mile of slough channel bank, and addresses erosion and sediment control along the slough channel.

Source: Project List Since Summary - Formattted

3.2.47 *Lewis and Clark National Wildlife Refuge*

Lead: Lewis and Clark National Wildlife Refuge, USFWS

Lewis and Clark National Wildlife Refuge includes about a third of the Columbia River estuary in Oregon, beginning 12 miles above the river's mouth and extending for 15 miles. It contains about 20 named islands totaling about 8,300 acres, as well as about 35,000 acres of sandbars, tidal marshes, mudflats, and open water.The estuary is a wintering and resting area for waterfowl that nest in Alaska and winter in Oregon and California. Many species of fish use the estuary for spawning, as a nursery, for feeding, and as a passageway between the ocean and upper Columbia River. Black bear, deer, elk and numerous smaller mammals are also present.

The Refuge’s development and management efforts aim to:

- Manage for conservation and recovery of threatened and endangered animal species in their natural ecosystems.
- Maintain a native diversity of wetland habitats for breeding/migratory/wintering waterfowl and other aquatic migratory birds associated with the Columbia River estuary.
- Maintain a native diversity of habitats for fish and wildlife associated with the Columbia River estuary.
- Provide opportunities for wildlife/wildlands-dependent recreation, education and research.

3.2.48 *Lower Columbia Fish Recovery Board (LCFRB) Subbasin Planning*

Lead: Lower Columbia Fish Recovery Board

LCFRB is a Washington State entity with responsibility for restoring listed fish populations within the state's southwestern five-county regions. It is leading a collaborative approach to restoring threatened anadromous fish species and rebuilding other focal fish and wildlife species in the Washington Lower Columbia River region. This approach integrates ESA recovery planning, NPCC subbasin planning, State salmon recovery strategies, and state watershed planning into a single coordinated regional planning process. The goal of this recovery/subbasin planning initiative is to develop a scientifically credible, socially and culturally acceptable, and economically and politically sustainable plan to:

- restore the region's four fish species listed as threatened under the ESA to healthy, harvestable levels
- protect and enhance other fish and wildlife species that have been adversely affected by the development and operation of the federal Columbia River Power System
- Through this process, by May 2004 eleven distinct subbasin plans will be rolled into a single comprehensive recovery/subbasin plan. The plan will address the recovery of four ESA listed species (chinook, steelhead, chum and bull trout) within the context of the 4Hs: habitat, hydroelectric, harvest, and hatchery impacts. Beyond this, the plan also will address selected anadromous and resident fish and wildlife of interest under the subbasin planning process. These additional focal species include coastal cutthroat trout, coho, sturgeon, smelt, northern pikeminnow, shad, warm water fish, Pacific lamprey, Caspian terns, Columbia white-tailed deer, dusky Canada goose, western pond turtle, sandhill crane, and selected neo-tropical birds.

The eleven subbasins included in the LCFRB comprehensive recovery/subbasin planning initiative are: Columbia Estuary, Columbia Gorge, Cowlitz, Elochoman, Grays, Kalama, Lewis, Little White Salmon, Lower Columbia Mainstem, Washougal, and Wind.

3.2.49 *Lower Columbia Habitat Mapping (LCR Project 200201200)*

Lead: Lower Columbia River Estuary Partnership (LCREP)

This project assessesses aquatic and wetland habitat condition in the lower Columbia River and estuary.

The project includes: acquiring satellite images at 5 and 15 meter resolution; conducting airborne hyperspectral image data collection at 1.5 meters resolution; collecting aerial videography; and using volunteers (citizens and agency experts) to gather vegetative data at selected sites to ground truth the aerial imagery. The data is then analyzed to provide a comprehensive, geographically-accurate dataset on basic tidal and freshwater habitat types, structure, and condition. The GIS maps developed from this process will then be used to identify habitats critical to the life stages of native organisms such as salmonids. Priorities for protecting and restoring critical habitats will be developed based on this assessment and potential projects identified.

A systematic approach to protecting and restoring habitat based on this data set and maps is being developed to guide the planning and implementation of all future habitat projects on the

lower Columbia River that will allow resource managers to make prudent, effective, science based decisions on protecting and restoring habitats critical to native species.

To date, the Estuary Partnership and the collaborating organizations have completed two years worth of data collection. The vegetative habitat of entire 146 miles of river has been classified and mapped and will soon be available in GIS format. In addition, hyperspectral imagery has been obtained for the entire shoreline of the river and several key focus areas. This data will provide habitat data in far greater detail than anything previously available and is critical to our efforts to understand the habitat needs of the lower Columbia River biota and in particular, the microhabitat needs of juvenile salmonids in the estuary.

3.2.50 *Lower Columbia River and Columbia River Estuary Ecosystem Monitoring and Data Management (BPA #30015)*

Lead: Lower Columbia River Estuary Partnership

In this project, the Lower Columbia River Estuary Partnership implements elements of its Aquatic Ecosystem Monitoring and Data Management Strategy to address habitat and toxics monitoring needs, and data management. The project addresses RPAs 161, 163, and 198. The ability to understand the relationship of sensitive organisms such as salmonids to the Lower Columbia River and Columbia River Estuary ecosystem is greatly hindered by major data gaps and poor access to existing data.

A pilot habitat monitoring program will be implemented to develop protocols, procedures, and indicators for measuring habitat condition for both long term habitat monitoring and restoration project monitoring and evaluation requirements. It will focus specifically on habitats important for juvenile salmonids. A technical team will develop the methods, critique and test the methods, assess the results, and recommend future work. Based on the results, a long term habitat monitoring rogram will be implemented.

Additionally, a toxic contaminant monitoring project will be implemented to address issues such as the accumulation of toxic contaminants in sensitive habitat areas, contaminant trends over time, and possible impacts on sensitive species. Toxic contaminant concentrations in fish and macroinvertebrate tissues, sediments and the water column will be determined. A technical team will assess the results and recommend future work. Based on the results, a long term toxics monitoring program will be implemented.

Finally, a prototype information center designed to house, store, analyze and disseminate data specific to the lower Columbia River and estuary will be developed and tested. The prototype will be the first step in the process of building a novel environmental information system that provides on line access to all data on the lower river and estuary in a variety of formats including raw data, processed data in report form, customized data as needed and on line assistance to pinpoint data needs and expedite access for users.

3.2.51 *Lower Columbia River and Estuary Research Needs Identification Workshop Proceedings 2003*

Lead: US Army Corps of Engineers

This workshop was held in March, 2003 in Portland to discuss research status and needs for the Columbia River Estuary (CRE). The objectives of the workshop included:

- Review the basis for USACE involvement in the CRE;
- Review past and ongoing research being conducted in the CRE;

- Identify data gaps and key research needs for future studies; and
- Prioritize as much as possible those research needs.

A large number of themes were discussed at the workshop, including: Developing a conceptual framework for ecosystem restoration in the CRE; Monitoring and selecting meaningful metrics and parameters; Identifying and prioritizing habitat creation and restoration options; Endpoint (target) definition; Mining under-used, older data; Information access and integration; Comparing historic vs. present habitat conditions; Hydrodynamic model data collection; Sediment transport and fate; Hydrograph changes; Linking physical processes with biological systems; Salmonid abundance, habitat use, migration, and timing; Stock identification, hatchery influences and phenotypic expression; Wetlands function; Nutrients, detritus, and primary productivity; Food web dynamics; Tributary conditions and opportunities for off-site mitigation; Toxic contaminants and geochemistry; Invasive species; Risks associated with restoring 10,000 acres in the CRE; and other miscellaneous topics.

The workshop did not end with construction of a list of priority research needs. However, the substance of discussions was noted, and that information has been compiled and synthesized in this document. Highest priority research avenues have been inferred from the workshop discussions in Section 4 of this document, which provides the US Army Corps of Engineers with the starting framework for funding research in the CRE that maximizes restoration potential and addresses key action items specified in the Federal Columbia River Power System Biological Opinion of 2000.

3.2.52 *Deep River Habitat Restoration*

Lead: Columbia Land Trust

This project will acquire and restore approximately 198 acres of forested wetland/floodplain habitat. Restoration will include levee breaches, tidegate removal, ditch filling, and swale enhancement. Reconnecting this floodplain property with the river will improve habitat and water quality, restore salmonid rearing habitat, and will increase basin productivity for all life history stages of salmonids.

3.2.53 *Grays Bay Restroration*

Lead: Columbia Land Trust

The Grays River is home to five species of salmonids: coho, chinook & chum salmon, steelhead, and searun cutthroat. Chinook, chum & steelhead are listed as threatened, and searun cutthroat is proposed as threatened. The Grays River supports the strongest remaining run of chum salmon in the Columbia River ESU. This project addresses limiting factors in the Grays River, including flood plain connectivity, bank stability, large woody debris, side channel availability, substrate fines, riparian condition, and temperature.

This project conserves one mile of riverfront, improving the quality and quantity of habitat for all life history stages of salmonids. This project also benefits all upriver Columbia Basin anadromous fish dependent on the Lower Columbia River estuary for juvenile nursery habitat. There are three elements to the proposed project:

Acquisition of 145 acres of old growth spruce wetland and 57 aces of associated forested upland along Grays Bay & Secret River;

Acquisition and restoration of 200 acres of ditched and diked floodplain at Devil's Elbow, to be reconnected to Grays River;

Acquisition of 125 acres of ditched and diked floodplain at Eden Valley. This project restores tidal function to 200 acres of the Grays River estuary by partial levee breaches and culvert removal. Restoring tidal function to the estuary improves water quality within the Grays and Columbia River estuaries. Reconnecting this floodplain with the river improves habitat & water quality as well as increasing the productivity of the basin

Phase IV will acquire and restore over 260 acres of estuarine wetlands, riparian areas, forested uplands and the lower portions of five creeks that enter the Lower Columbia River estuary in the project area. Brooks Slough provides important estuarine rearing habitat (a regional limiting factor) for Columbia Basin salmonids. This project will add 150 acres to the Lower Columbia estuary. Project activities include: acquiring the land; removing two tidegates, a pump station, and several buildings; installing three large open pipes to restore connection of 150 acres of estuary to the Columbia River; restoring two miles of creek habitat, restoring a 30 acre emergent wetland; and reforesting 30 acres of riparian and upland habitats.

This project will benefit several threatened and endangered species, including salmonids produced within and migrating through the Lower Columbia River Estuary. The habitat objectives are to restore a complex mosaic of stream channels, tidal swales, wetlands and riparian forest with open connection to Brooks Slough. Restoration of stream, flood-plain, estuarine and forested habitats will improve habitat for salmonids, improve water quality and increase productivity of adjacent habitats. Ducks Unlimited, NRCS, and USFWS will assist with project design and implementation. Property will be transferred to USFWS for ownership and management.

3.2.54 *Chinook River Estuary Restoration and Monitoring*

Lead: Sea Resources and partners

Since 1996 Sea Resources has worked with partners on a comprehensive plan to restore the historic natural productivity of the Chinook River Watershed. Sea Resources is planting native vegetation in riparian zones, repairing culverts and bridges, and remediating sediment sources. In addition to these restoration projects, Sea Resources is working in partnership with USFWS, WDFW, NRCS, Ducks Unlimited, Columbia Land Trust, and the Lower Columbia Fish Recovery Board to restore estuarine habitat to almost 1,100 acres of the Chinook River estuary. This restored estuary will provide critical rearing habitat to salmonids from the Chinook River as well as salmonids from the entire Columbia River Basin. For this restoration effort to be successful it is necessary to have a comprehensive monitoring plan in place.

In February 2000 Sea Resources began monitoring smolt migration with two smolt traps. One at the mouth of the Chinook River and one just upstream from the hatchery. In June 2000 we established eight monitoring sites and began measuring temperature, DO, and turbidity at each site. In October of 2000 we received a grant from the US Fish and Wildife Service to purchase new monitoring equipment. That equipment greatly increased our monitoring capability and we began to measure salinity, conductivity, pH, and flow. In addition obtained an additional six HOBO temperature data loggers - one for each site.

3.2.55 *Lower Columbia: Clatskanie Watershed Assessment*

Portland State University prepared the Lower Columbia-Clatskanie Watershed Assessment for the Lower Columbia River Watershed Council in 2001. The watershed assessment will be used as a guide for the prioritization and design of restoration projects.

The Lower Columbia-Clatskanie Watershed Assessment describes the watershed and discusses the following:

- Declining wild salmon and steelhead populations
- Water quality parameters for E. Coli and dissolved oxygen
- Loss of streamside vegetation and functions and increased amount of sediment entering streams from forestry activities
- High summer water temperatures in streams
- Stream straightening and channelization

3.2.56 *Lower Columbia: Grays River Estuary*

Lead: Columbia Land Trust

This project will acquire and restore 112 acres of estuarine wetlands and two miles of river and riparian habitat in the Grays River Estuary along the Lower Columbia River in Wahkiakum County. The Grays River is home to ESA-listed chinook, chum, and steelhead, as well as coho and searun cutthroat trout. Restoration elements include restoring tidal function to the estuary by partially breaching levees and removing culverts. Goals are to improve estuarine salmon nursery habitat, improve water quality, and increase salmon productivity in both the Grays River and Columbia River estuaries. Project partners include WDFW and Ducks Unlimited.

3.2.57 *Map Subtidal Large Woody Debris and Other Habitat Features in Relation to Fish Distribution in the Lower Columbia River Estuary (BPA #30014)*

Lead: Battelle Marine Sciences Laboratory

This project maps and assesses the importance of estuarine and tidal wetland habitats at selected sites in the Columbia River estuary.

The project will use side scan sonar and underwater video to map “types” and “densities” of subtidal LWD. This will be coupled to classified habitats from CASI aerial imagery to provide complementary and seamless GIS maps from upland to subtidal survey depth. The project will also assess fish distributions using a Dual-frequency Identification Sonar (DIDSON) acoustic camera at sites with LWD. The DIDSON camera can capture near-video-quality images, and is not hampered by low light or turbid water. Data will be collected and stratified over both high and low tidal stages. Fish distribution patterns will be spatially linked to distribution of LWD in a geographical information system (GIS) framework. The project will also quantify conditions that foster concentrations of woody debris with occurrences of high salmonid concentrations. The project predicts that this information would be extremely useful in determining the most suitable locations, from a landscape perspective, for placement of woody debris under a restoration or enhancement effort.

3.2.58 *Mccarthy Creek Wetland Restoration*

Lead: Ducks Unlimited

This proposal seeks funding for restoration of floodplain connectivity among three properties. Fishways and water control structures will allow for adaptive management to promote habitat recovery for threatened, endangered, and other wetland-dependent species.

OWEB funds are requested for permitting, engineering, contracted labor, construction management/materials and five years of monitoring.

3.2.59 *Monitoring of the Chinook River Estuary Restoration Project*

Lead: Sea Resources

In 1996 Sea Resources began the implementation of a comprehensive plan to restore the historic natural productivity of the Chinook River Watershed. Sea Resources is committed to improving fish habitat in the entire Chinook River Watershed. We are planting native vegetation in riparian zones, repairing culverts and bridges, and remediating sediment sources. In addition to these restoration projects, Sea Resources is working in partnership with USFWS, WDFW, NRCS, Ducks Unlimited, Columbia Land Trust, and the Lower Columbia Fish Recovery Board to restore estuarine habitat to almost 1,100 acres of the Chinook River estuary. This restored estuary will provide critical rearing habitat to salmonids from the Chinook River as well as salmonids from the entire Columbia River Basin. For this restoration effort to be successful it is necessary to have a comprehensive monitoring plan in place.

In February 2000 Sea Resources began monitoring smolt migration with two smolt traps. One at the mouth of the Chinook River and one just upstream from the hatchery. In June 2000 we established eight monitoring sites and began measuring temperature, DO, and turbidity at each site. In October of 2000 we received a grant from the US Fish and Wildife Service to purchase new monitoring equipment. That equipment greatly increased our monitoring capability and we began to measure salinity, conductivity, pH, and flow. In addition obtained an additional six HOBO temperature data loggers - one for each site.

3.2.60 *Native Fish Conservation Policy, Revised September 2003*

Lead: Oregon Department of Fish and Wildlife

The purpose of the Native Fish Conservation Policy is to ensure the conservation and recovery of native fish in Oregon. This policy focuses on naturally produced native fish. The Hatchery Management Policy describes conservation of hatchery produced native fish.

The intent of the Native Fish Conservation Policy is to provide a basis for managing hatcheries, fisheries, habitat, predators, competitors, and pathogens in balance with sustainable production of naturally produced native fish. The policy has three areas of emphasis. The first is defensive to ensure the avoidance of serious depletion of native fish. The second is more proactive to restore and maintain native fish at levels providing ecological and societal benefits. The third ensures that, consistent with native fish conservation, opportunities for fisheries and other societal resource uses are not unnecessarily constrained. This approach will allow Oregon to play a vital role in the recovery of ESA listed species and the prevention of future listings.

The policy embraces the case-by-case application of a wide range of conservation and utilization strategies tailored to individual watersheds and situations. Policy implementation will likely illustrate a variety of management approaches across the landscape, such as areas focused on hatchery programs complemented with areas where hatchery influences are avoided.

The policy shall be implemented through conservation plans. Plans shall be developed in collaboration with management partners and the public, and will identify the desired and existing status of native fish, key limiting factors, management options to address these factors, and monitoring required to evaluate success. The Oregon Plan for Salmon and Watersheds, as well as other local and regional forums, shall provide the context for development, implementation and

coordination of these plans. Existing rules shall guide management until conservation plans are completed

3.2.61 *Ocean Survival of Juvenile Salmonids in the Columbia River Plume (BPA#199801400)*

Lead: U.S. National Marine Fisheries Service, Oregon State University and Oregon Graduate Institute, NW Fisheries Science Center, 1998 to present

This study evaluates the role of the Columbia River plume on growth and survival of juvenile salmon. The study focuses on the hypothesis that variation in the physical and biological conditions of the nearshore environment, particularly that associated with the Columbia River plume, affects overall survival of Columbia River stocks. Primary factors being evaluated include (a) food availability and habits, (b) time of entry, smolt quality, and growth and bioenergetic status at the time of entry and during the first growing season in the ocean, and (c) predation. (A companion study on predation on juvenile salmon is ongoing.) The study proposes to characterize, over a 10-year period, the physical and biological features of the nearshore ocean environment with real-time and modeling projections of the Columbia River plume as it interacts with the coastal circulation regime, and to relate these features, both spatially and temporally, to variation in salmon health, condition, and survival.

3.2.62 *Optimization of Fcrps Impacts on Juvenile Salmonids: Restoration of Lower-Estuary and Plume Habitats (BPA #30002)*

Lead: Oregon Health & Science University, OGI School of Science & Engineering

This project optimizes the interaction of the Federal Columbia River Power System (FCRPS) with the lower Columbia River estuary and plume in support of endangered salmonids. The timing and magnitude of flows released by the FCRPS strongly affect juvenile salmonids as they move through the estuary and plume. Restoration of the properties of the lower estuary and plume that constitute habitat for juvenile salmonids requires advances on several fronts.

Project objectives:

- Define how the lower-estuary and plume interacted historically with coastal currents, how operation of the FCRPS has altered the lower-estuary and plume, and how climate change and the FCRPS will impact the system in coming decades.
- With Action Agencies, define needs and opportunities for science-based input to operational FCRPS management practices, given uncertain climate and coastal circulation forecasts.
- With FCRPS managers, define management scenarios: a) that are based on physical understanding, b) that can be evaluated in terms of habitat opportunity and other constraints on the system, and c) whose implementation can lead to a qualitative improvement in survival of juvenile salmonids.
- The project will use remote sensing, management science and analyses of numerical model results to achieve the goals of the project, as it moves from research toward provision of definite strategies over the next 6 to 10 years.

A Project Advisory Board (PAB) that includes Action Agency personnel, FCRPS managers and external scientists will be formed to help ensure productive application of the insights achieved. Tight cooperation with work carried out in the estuary and plume by the

National Marine Fisheries Service (NMFS) will be facilitated by participation of PIs in this project as well as in two projects proposed by NMFS.

3.2.63 *Oregon Columbia Tributaries West: Watershed Analysis, Columbia River Gorge National Scenic Area, 2001*

Lead: USDA Forest Service, Columbia River Gorge National Scenic Area

This study, completed in 2001 by the USDA Forest Service, is a compilation of prevailing knowledge of the area by various resource specialists. It provides descriptive data about past and present physiological, ecological and cultural conditions. Recommendations drawn from a synthesis of this information provide management guidance for the federal lands located in the watershed. While the study provides analysis and recommendations for desired future conditions, it is not a decision-making document.

3.2.64 *Oregon Spartina Response Plan*

Lead: Oregon Department of Agriculture

This Oregon Spartina Response Plan reviews the biology and historical and current information of Spartina on the west coast and outlines a strategy to prevent, detect, identify, and eradicate the weed in Oregon. The goal of Spartina management in Oregon is to prevent the establishment and spread of any Spartina species in Oregon estuaries and coastal wetlands. It identifies the Oregon Department of Agriculture as the lead agency in this effort, but describes a coordinated approach that requires the cooperation of preserve and refuge managers, mariculturists, state and federal agencies, and those who use Oregon's estuaries to protect them from Spartina damage.

Outreach and education about the threat and management of Spartina and measures to prevent introduction are important elements of the Plan. The many potential pathways to introduction, however, suggest that Spartina is highly likely to invade Oregon estuaries. Therefore, early detection and rapid response are key components of the Plan.

Detection will be done using aerial, boat, and ground surveys. Taxonomic experts that are identified in the Plan will positively identify any suspect plants. The Plan provides a scaled response to the detection of Spartina in Oregon based on the species, size and stage of growth of the infestation, efficacy of various management techniques, and site characteristics. Management options include digging and covering, mowing, and chemical methods. An integrated strategy that includes a combination of management methods is likely to be required.

3.2.65 *Pacific Bald Eagle Recovery Plan, 1986*

Lead: USFWS

The Pacific Bald Eagle Recovery Plan (USFWS, 1986) provides detailed background information on bald eagles and reviews and evaluates their status in the 7-state Pacific recovery area. The Recovery Plan states that the primary objective of the recovery process is, ". . .to provide secure habitat for bald eagles. . . and to increase population levels in specific geographic areas to the extent that the species can be delisted."

The Recovery Plan lists four criteria for delisting:

- a minimum of 800 nesting pairs in the Pacific recovery area;
- average reproductive rate of 1.0 fledged young per pair [5-year average], with an average success rate per occupied site of not less than 65%;

- attainment of breeding population goals in at least 80% of the management zones (Recovery Zones) with nesting potential;
- stable or increasing wintering populations.

The Recovery plan is the basis for the 1990 Working Implementation Plan for Bald Eagle Recovery in Oregon and Washington.

3.2.66 *Pacific Coastal Salmon Recovery Fund (Pcsrf)*

Lead: States of Washington, Oregon, California and Alaska, (NOAA)

The Pacific Coastal Salmon Recovery Fund (PCSRF) was established in FY2000 to provide grants to the states and tribes to assist state, tribal and local salmon conservation and recovery efforts. The PCSRF was requested by the governors of the states of Washington, Oregon, California and Alaska in response to Endangered Species Act (ESA) listings of West Coast salmon and steelhead populations. The PCSRF supplements existing state, tribal and federal programs to foster development of federal-state-tribal-local partnerships in salmon recovery and conservation; promotes efficiencies and effectiveness in recovery efforts through enhanced sharing and pooling of capabilities, expertise and information. The goal of the Pacific Coastal Salmon Recovery Fund is to make significant contributions to the conservation, restoration, and sustainability of Pacific salmon and their habitat.

Recovery of sustainable salmon populations will likely take decades and require a substantial investment over several salmon life cycles. Nonetheless, it is important to track the work accomplished by current investments and measure activities and changes on a regular basis. NMFS has developed a comprehensive performance measurement system for the PCSRF in conjunction with the States and Tribes in response to requests by OMB and Congress for program accountability. The MOUs between NMFS and the States and Tribes, which established criteria and goals for prioritizing PCSRF funds to projects designed to conserve and restore Pacific salmonids, have been amended to include the program-wide Performance Goals and Reporting Metrics developed in May 2003. Aggregation of these project level reporting metrics, combined with larger scale watershed and subbasin assessments and results from monitoring and evaluation efforts, will allow (over the long term) an assessment of program effectiveness in terms of increased numbers of salmon. Progress towards the PCSRF program goal and program achievements on performance goals will be reported annually to Congress commencing with the next annual report in 2004.

3.2.67 *Passage of Juvenile and Adult Salmonids at Columbia and Snake River Dams*

Lead: NMFS Northwest Fisheries Center

This report summarizes the information pertinent to the FCRPS as it is currently configured for each route of passage and life history, and discusses uncertainties associated with the existing database. The reader is referred to Mighetto and Ebel (1994) and Whitney et al. (1997) for historical reviews of studies conducted over the past decades to evaluate the causes of fish loss, various improvements tested, and programs implemented to improve fish condition and survival through the FCRPS.

Development of the Federal Columbia River Power System (FCRPS) on mainstem Snake and Columbia Rivers began with the completion of Bonneville Dam in 1938, and ended with the construction of Lower Granite Dam in 1975 (Fig. 1). Throughout the past six decades, many

structural configurations and operational strategies have been tested to improve the survival of juvenile and adult salmonids (Oncorhynchus spp.) passing through the FCRPS.

3.2.68 *Pierce National Wildlife Refuge*

Lead: USFWS, Pierce National Wildlife Refuge

The Pierce National Wildlife Refuge is part of the Ridgefield National Wildlife Refuge in southwest Washington. It consists of 336 acres of river bottomland habitat with riparian areas, wetlands, grasslands and hardwoods. The refuge provides habitat for Canada geese, a variety of other waterfowl and numerous other wildlife species. Hardy Creek supports one of the last remaining chum salmon runs in the lower Columbia River drainage. The south end of the refuge can be viewed from the Beacon Rock trail.

- The refuge development and management efforts aim to:
- Maintain native diversity of wetland habitats for breeding/migrating/wintering waterfowl and other aquatic migratory birds with a special emphasis on Canada geese.
- Provide and enhance habitat for endangered, threatened and sensitive species.
- Enhance wildlife diversity through habitat management.
- Restore natural, dynamic stream/river systems, including their associated in-water and riparian habitats for anadromous fish, breeding neotropical birds and other native fish and wildlife.
- Provide opportunities for quality, wildlife dependent recreation, education and research to enhance public appreciation, understanding and enjoyment of refuge fish, wildlife and habitats.
- Preserve designated cultural resources.

The Ridgefield National Wildlife Refuge Complex is comprised of five refuges located in the southwest part of the state of Washington: Ridgefield north of Vancouver; Conboy in the southcentral part of the state; and Franz Lake, Pierce and Steigerwald Lake all located in the Columbia River Gorge.

3.2.69 *Preliminary Conclusions Regarding the Updated Status of Listed Esus of West Coast Salmon and Steelhead (February 2003, Co-Manager Review Draft)*

Leads: West Coast Salmon Biological Review Team, Northwest Fisheries Science Center, Southwest Fisheries Science Center

This draft report summarizes preliminary scientific conclusions of the NMFS Biological Review Team (BRT) regarding the updated status of 26 ESA-listed Evolutionarily Significant Units (ESUs) of salmon and steelhead (and one candidate species ESU) from Washington, Oregon, Idaho, and California. These ESUs were listed following a series of status reviews conducted during the decade of the 1990s. The status review updates were undertaken to allow consideration of new data that have accumulated over the various time periods since the last updates and to address issues raised in recent court cases regarding the ESA status of hatchery fish and resident (nonanadromous) populations. The draft BRT conclusions in this report should be considered preliminary for two reasons. First, the BRT will not finalize its conclusions until state, tribal, and other federal comanagers have had an opportunity to review and comment on the draft report. Second, some policy issues regarding the treatment of hatchery fish and resident fish in ESU determinations and risk analyses are not resolved at this time.

When finalized, this draft report would represent the first major step in the agency's efforts to review and update the listing determinations for all listed ESUs of salmon and steelhead. By statute, ESA listing determinations must take into consideration not only the best scientific information available, but also those efforts being made to protect the species. After receiving the final BRT report and after considering the conservation benefits of such efforts, NMFS will determine what changes, if any, to propose to the listing status of the affected ESUs.

3.2.70 *Preliminary Estimates of Updated "Indicator Metrics" Applied in the 2000 FCRPS Biological Opinion*

Lead: NOAA Fisheries

As NOAA Fisheries begins the remand of the 2000 FCRPS Biop, it is necessary to update the biological information, including the indicator metrics. Recently, NOAA Fisheries' West Coast Salmon Biological Review Team (BRT) released a draft review of the status of listed ESUs in the Columbia River basin (BRT 2003). This report uses the information assembled by the BRT, along with supplemental analyses, and converts it to "indicator metrics" to provide a preliminary look at how these have changed in response to recent returns since the 2000 FCRPS Biop was issued. Additionally, a supplemental analysis that looks at the sensitivity of choice of time period for "lambda" estimation was included at the request of Federal fisheries managers.

The information in this report was presented in preliminary form to Federal Caucus members on July 23, 2003, and was presented to the Columbia Basin Fish and Wildlife Authority (CBFWA) Anadromous Fish Managers on July 30, 2003.

This exercise of updating the 2000 FCRPS Biop's "indicator metrics" should not be taken as a commitment on NOAA Fisheries' part to employ identical methodology in the new biological opinion. We will be reviewing some of these methods through a process that was specified in the 2000 FCRPS Biop. We will also be reviewing the methods in light of the recent ruling on biological opinion remand.

3.2.71 *Preserve and Restore Columbia River Estuary Islands to Enhance Juvenile Salmonid and Columbian White-tailed Deer Habitat. (BPA #30011, Cre Project 200301800)*

Lead: U.S. Fish and Wildife Service - Willapa National Wildlife Refuge and Satellites, Columbia Land Trust, USGS - BRD Columbia River Research Laboratory

This project acquires and restores 626 acres of tidal emergent marsh, swamp, slough, and riparian forest habitat on islands in the upper Columbia River Estuary to benefit fish and wildlife. This is a cooperative effort between BPA, USFWS, Columbia Land Trust, USGS, Corps of Engineers, WDFW, and ODFW.

The Columbia Land Trust would acquire 426 acres on Crims Island and 109 acres on Walker Island. USFWS would acquire an additional 90 acres on Crims Island. At Crims Island, the Corps of Engineers would provide funding through Section 1135 of the Clean Water Act to enhance 75 acres of tidal emergent marsh by excavating canary grass wetland and connecting subtidal channels to the mainstem Columbia. In addition, tidal flow would be reestablished to 100 acres of wooded swamp by excavating a man-made plug in a channel and 100 acres of riparian forest would be reestablished on upland areas of the island. These actions would provide productive rearing and foraging habitat for juvenile salmon and increase the export of

detrital nutrients to the estuary. A monitoring program would be initiated to measure the response of fish, especially juvenile salmon, and vegetation to these enhancements. Approximately 150 acres of existing tidal emergent marsh on Crims and Walker Islands would be restored by controlling invasive exotic plants, principally purple loosestrife and reed canarygrass. Columbian White-tailed deer would be reintroduced to these and nearby islands to restore this native species to the upper estuary. This action would establish a new subpopulation of the deer on secure habitat to meet the goals of the Columbian White-tailed Deer Recovery Plan. Funding for the reintroduction would be shared between BPA, USFWS, WDFW, and ODFW.

3.2.72 *Re-introduction of Lower Columbia River Chum Salmon into Duncan Creek (BPA 200105300)*

Lead: Pacific States Marine Fisheries Commission, Washington Department of Fish and Wildlife

In this project, a three-pronged approach is being used to once again produce a self-sustaining chum salmon population in Duncan Creek. This approach includes modifying the dam, enhancing spawning habitat, and using local brood stock to reintroduce chum into the basin. Dam modification was accomplished in November 2000, stream restoration was completed in November 2001, and brood stock collection was begun in November/December 2001.

This project addresses the continued collection of brood stock and outlines a comprehensive plan for monitoring and evaluating the Duncan Creek chum reintroduction. To "jump-start" the reintroduction program, eggs are currently being collected from adjacent chum salmon stocks (e.g. Hardy and Hamilton Creeks, and the Ives/Pierce Island complex), incubated at the Washougal Hatchery, and will be liberated into Duncan Creek after hatching. In future years, incubation may occur in streamside incubators as well. Developing embryos will have their otoliths thermally marked during incubation. Otolith marks will be utilized to evaluate the fry-to-adult survival rates of the introduced fish. The occurrence of non-marked adult chum entering the stream will be used to estimate how quickly wild fish are recolonizing the stream. The physical conditions in the newly renovated stream channels will be monitored as well as the egg-to-fry survival rates of natural spawners.

The principle objectives of this project are to continue the collection of brood stock for use in the Duncan Creek reintroduction, to monitor and maintain the physical conditions necessary for chum salmon spawning in the newly renovated stream channels, and to evaluate the viability of using this approach to chum salmon recovery as a template for future reintroduction projects.

3.2.73 *Research, Monitoring, and Evaluation Plan for the Columbia River Estuary and Plume*

Leads: BPA, USACE, NOAA Fisheries

The Bonneville Power Administration (BPA), in coordination with the U.S. Army Corps of Engineers (COE) and National Oceanic and Atmospheric Administration (NOAA) Fisheries, originated this project (BPA Project No. 2002-077-000; Contract No. 652). Their goal was to provide coordination and facilitation of activities of the estuary/ocean subgroup (EOS) for research, monitoring, and evaluation (RME) arising from the 2000 National Marine Fisheries Service (now called NOAA Fisheries) Biological Opinion (BiOp) on operation of the Federal Columbia River Power System (FCRPS). Specifically, the EOS was tasked with developing the RME plan for the Columbia River estuary and plume (CRE&P) for BiOp Reasonable and

Prudent Alternative (RPA) Action 161. The EOS functions under the auspices of the basin-wide RME planning process to implement the FCRPS BiOp, spearheaded by the federal action agencies (BPA, COE, Bureau of Reclamation) and NOAA Fisheries. The EP-RME plan is a stand-alone document, although it eventually will be incorporated into the basin-wide RME plan for BiOp implementation.

The goal of the research, monitoring, and evaluation (RME) program for the Columbia River estuary and plume (CRE&P) is threefold: 1) Status Monitoring -- quantify the status and trends in listed salmon usage and survival in the CRE&P; 2) Action Effectiveness -- quantify the effects of the habitat restoration actions on listed salmon in the CRE&P; and 3) Uncertainties -- resolve uncertainties related to salmon recovery actions in the CRE&P. Thus, RME for the estuary and plume (EP-RME) embodies many of the same elements at Tributary RME, e.g., ecosystem and habitat status monitoring questions. Action effectiveness research in the CRE&P focuses on habitat restoration, as does the uncertainties research.

In the draft basin-wide RME plan (RME Plan 2003), research, monitoring, and evaluation activities are focused on the listed salmon and steelhead species in the hierarchical context of the ecosystems, subbasins, and habitats supporting these populations. The basin-wide plan encompasses RME activities in habitats used by juvenile and adult life stages of salmonids including natal streams and tributaries, the mainstem hydrosystem, the estuary, and the Columbia River plume in the nearshore ocean. As a subset of the basin-wide RME effort, the plan covers BiOp RME in the Columbia River estuary and plume.

3.2.74 *Return to the River 2000*

Lead: Independent Science Group (ISG)

Beginning in 1982, the NWPPC has developed a basin-wide Fish and Wildlife Program to direct fish and wildlife funding by BPA. In the 1992 Fish and Wildlife Program, NWPPC created the Independent Science Group, and in the 1994 Fish and Wildlife program, the Council directed the ISG to develop an explicit conceptual foundation and conduct a biennial review of the Fish and Wildlife Program.

This report is the result of that directive. The ISG examined the scientific basis for fish and wildlife recovery in the Columbia River and, in the light of continued declines of salmon and other species, developed an alternative conceptual foundation that is grounded in modern scientific thought.

The Council's fish and wildlife program is developed from recommendations submitted by a variety of interested parties, but especially the region's tribal, state, and federal fish and wildlife management agencies. As such, it mirrors the themes of traditional fisheries management in North America. Because of this, the ISG review and development of a conceptual foundation, while focused on the Columbia River and the Council's program, are applicable to a broad spectrum and wider geographic extent of fisheries management problems.

The report is organized into three sections:

Part I. An introduction and background to the salmon problem (Chapter 1), followed by a description of the current conceptual foundation directing salmon restoration and an analysis of the scientific basis for the assumptions and beliefs implied by measures in the Council's Fish and Wildlife Program (Chapter 2), and finally, an explicit description of an alternative ecologically based conceptual foundation for fish and wildlife management (Chapter 3).

Part II. A technical review and documentation of major scientific issues and topics supporting the conceptual foundation (Chapters 4-9).

Part III. A review of the role of monitoring and evaluation in salmon restoration (Chapter 10), and the Independent Scientific Group's conclusions and strategies for restoration from the overall review (Chapter 11).

3.2.75 *Review of Methods, Progress and Cross-Validation Studies Pertaining to Population Trend and Risk Assessment for Columbia River Salmonids*

Lead: NMFS, Northwest Fisheries Science Center

The purpose of this report is to review and discuss methods for estimating and presenting population trends and extinction risks for Columbia River salmonid populations to support management decisions, such as the ESA Section 7 determination in the 2000 FCRPS Biological Opinion and the anticipated 2005 and 2008 check-in tests. This report reviews research since 2000, which tests and validates diffusion approximation methods for estimating population trends and risks. This review summarizes information from the following publications:

Holmes, E. E. 2004. Beyond theory to application and evaluation: diffusion approximations for population viability analysis. In press in Ecological Applications.

Fagan, W. F., E. E. Holmes, J. J. Rango, A. Folarin, J. A. Sorensen, J. E. Lippe, and N. E. McIntyre. 2003. Cross-validation of quasi-extinction risks from real time series: an examination of diffusion approximation methods. Pre-print.

McClure, M., E. Holmes, B. Sanderson, and C. Jordan. 2003. A large-scale, multi-species risk assessment: anadromous salmonids in the Columbia River Basin. Ecological Applications 13: 964-989.

Holmes, E. E. and W. F. Fagan. 2002. Validating population viability analysis for corrupted data sets. Ecology 83: 2379-2386

Holmes, E. E. 2001. Estimating risks in declining populations with poor data. Proceedings of the National Academy of Science 98: 5072-5077.

3.2.76 *Review of Relative Fitness of Hatchery and Natural Salmon (Draft Technical Memorandum)*

Lead: NMFS, Northwest Fisheries Science Center

The objectives of this paper are to summarize the latest information on the relative fitness of hatchery and natural Pacific salmon and steelhead and to determine if there are any general patterns relating the origin and history of hatchery stocks to their relative fitness.

Since NMFS (2000a), numerous additional studies on the relative fitness of hatchery fish have been published in both the peer-reviewed and gray literature. Hatcheries have a variety of purposes, including mitigation for lost habitat, harvest augmentation, supplementation of naturally spawning populations, and conservation of genetic resources. Consequently, broodstock sources, rearing and release practices, and genetic management protocols vary widely. Differences in hatchery broodstock management protocols are likely to affect the relative fitness of hatchery fish. In order to know what typical values of hatchery fish relative fitness are, it is necessary to obtain estimates from a wide variety of program types and species.

We emphasize that we are reviewing studies of the relative fitness of hatchery and natural fish in the natural environment. In some cases, hatchery fish could have high

3.2.77 *Revised Columbia White-Tailed Deer Recovery Plan*

Lead: U.S. Fish and Wildife Service, 1976

The Revised Columbia White-Tailed Deer Recovery Plan outlined methods of re-establishing white-tailed deer near the Columbia River. Land use practices since 1972 via an interim management plan have encouraged the regrowth and reestablishment of permanent cover on many areas of the refuge with a history of heavy grazing. Continuous evaluation of deer responses to land use changes is necessary so that the proper balance between short grass/forb pastures and dense cover is maintained. The integrity of the Columbia River population of Columbia white-tailed deer (CWTD) and their habitat is threatened by a variety of factors, including both natural and man-caused phenomena including:

- Degradation of riparian habitats through logging and brush removal (Crews 1939; Scheffer 1940; Gavin 1978).
- Recent interest in development of riparian zones for beef production, cottonwood and alder harvest and for marina development.
- Automobile collisions.
- Poaching.
- Entanglement in barbed wire fences.
- Competition with livestock.
- Introduction of feral swine on Wallace Island in 1980.
- Major flooding.
- The inundation of over 1,400 acres for nearly 1.5 years due to a dike failure.
- High tides which are a limiting factor on undiked islands of the lower river.
- Disease (foot rot) and parasites (stomach worms), two threats common to the Columbia River population.
- The potential threat of black-tailed deer to CWTD by direct competition for available food sources and by hybridization.
- Presence of Roosevelt elk on the mainland portion of CWTD NWR.

3.2.78 *Role of the Estuary in the Recovery of Columbia River Basin Salmon and Steelhead: and Evaluation of Limiting Factors*

Lead: NMFS Northwest Fisheries Science Center

The overall purpose of this document is to evaluate and rank candidate limiting factors in the estuary with respect to the potential of each factor to affect population status or suppress population specific recovery. Rankings will be characterized as having a low, moderate, or high potential to improve population status by changing or improving current habitat conditions. The key element of our approach is to evaluate limiting factors from the perspective of overall population viability status and not simply abundance or survival as has traditionally been done.

To define salmon recovery needs, NOAA Fisheries evaluates Viable Salmon Populations (VSP) based on four performance criteria: abundance, population growth rate, spatial structure,

and diversity (McElhany et al. 2000). In general, levels of these criteria in aggregate define extinction risk or persistence of the population.

To better understand the role of the Columbia River estuary in population viability, we emphasize the role of the estuary in contributing to the VSP attributes of diversity and spatial structure. We focused on these VSP attributes because as described in a subsequent section, our hypothesis is that a primary role of estuaries in salmon life history and ecology is to contribute to the persistence or viability of populations by contributing to the spatial structure and the range of life history strategies to use these places. The focus of this document is thus on defining potential for improvement in population status from the perspective of how limiting factors in the estuary primarily, but not exclusively, affect these two VSP attributes.

3.2.79 *Reasonable and Prudent Alternatives*

Lead: NOAA Fisheries

Issued by NOAA Fisheries (for salmon and steelhead) and USFW (for bull trout and sturgeon), the BiOps, recommend 199 ways, called "reasonable and prudent alternatives," to avoid jeopardizing ESA-listed fish. Addressing everything from fish passage and transportation improvements to selective fishing methods, hatchery plans and habitat protection, they set population growth rates for listed fish and performance standards for the hydro system to achieve by 2010, with formal interim evaluations in 2003, '05 and '08.

- RPA 158 : Action Plan to Implement the Federal Columbia River Power System Biological Opinion in the Columbia River Estuary (Prepared in response to RPA 158) (ma#23, above)
- RPA 159 and 160: Ecosystem Restoration Plan with Emphasis on Salmonids in the Columbia River Estuary
- RPA 161: Between 2001 and 2010, Corps and BPA to fund a monitoring and research program acceptable to NMFS and closely coordinated with LCREP management plan. Status: Plan being developed – review draft out. To be complete by end of September 2003.
- RPA 162: BPA to work with NMFS to develop a conceptual model of the relationship between estuarine conditions and salmon population structure and resilience.
- RPA 196-197: Relates to funding for research in the estuary and Columbia River plume.

Relationship to other processes: research and monitoring program will be described in the 158 plan. Projects implemented under action 160 will be monitored according to this plan. Monitoring will also include trend analysis. Action 162 (conceptual mode) will provide a framework to support future research undertaken as part of actions 161, 196, and 197.

(These actions fund research and monitoring as proposed in Action 161).

3.2.80 *Salmon and Steelhead Limiting Factors Water Resource inventory Areas 24-28,*

Lead: Washington State Conservation Commission, 2000

Section 10 of the Salmon Recovery Act of 1998 (Engrossed Substitute House Bill 2496), directs the Washington State Conservation Commission, in consultation with local government and treaty tribes to invite private, federal, state, tribal, and local government personnel with appropriate expertise to convene as a Technical Advisory Group (TAG). The purpose of the TAG is to identify habitat limiting factors for salmonids. Limiting factors are defined as "conditions that limit the ability of habitat to fully sustain populations of salmon,

including all species of the family Salmonidae." The bill further clarifies the definition by stating "These factors are primarily fish passage barriers and degraded estuarine areas, riparian corridors, stream channels, and wetlands." It is important to note that the responsibilities given to the Conservation Commission in the Salmon Recovery Act do not constitute a full limiting factors analysis. This report is based on a combination of existing watershed studies and knowledge of the TAG participants.

Five WRIAs drain to the Estuary and Lower Columbia subbasins. They include:

- WRIA 25 and 24. Water Resource Inventory Area (WRIA) 25 is located in southwest Washington. The area encompasses 322,582 acres including all of Wahkiakum and portions of Cowlitz, Pacific, and Lewis counties. Located along the Lower Columbia River, the majority of this watershed is in the Coast Range eco-region. All of the drainage's within the WRIA are tributaries to the Columbia River. Although located in WRIA 24, the Chinook River is the western most tributary to enter the Columbia River in Southwest Washington and has been included in this report.
- WRIA 26 is located in southwest Washington within portions of Lewis, Cowlitz, Skamania, Pierce and Yakima Counties, and it includes the Cowlitz River systems and its major tributaries: the Coweeman, Toutle, Tilton and Cispus Rivers. The Cowlitz River enters the Columbia River at RM 68.
- WRIA 27 is located in southwest Washington within portions of Skamania, Clark and Cowlitz Counties, and it includes three major watersheds: the Kalama River, the Lewis River (North Fork) and the East Fork Lewis River. All river systems within WRIA 27 drain to the Columbia River. Six stocks of anadromous salmon and steelhead return to these rivers. For purposes of this analysis, the WRIA was separated into four subbasins: lower and upper Lewis River (below and above the dams), East Fork Lewis and Kalama.
- WRIA 28 is located in southwest Washington, with boundaries that extend to the western margins of the Wind River to the east, the Columbia River to the south and the East Fork Lewis River to the north. The inventory area includes the southern and eastern portions of Clark County and southwestern Skamania County. For purposes of this report, WRIA 28 was divided into three major subbasins: the Lake River Subbasin, the Washougal River Subbasin and the Bonneville Tributaries Subbasin. These drainages cover approximately 316,365 acres or 494 square miles and enter the Columbia River between river mile (RM) 87.6, at Lake River, and RM 142.3 near Bonneville Dam.

3.2.81 *Salmon at the River's End*

Lead: NMFS, 2001

Salmon at the River's End" is a comprehensive state-of-the-knowledge description of the ecological underpinnings of the Columbia River estuary. This study reviews the historical development of the CRE relative to changes in salmon populations, evaluates alternative conceptual frameworks for evaluating estuarine habitat conditions, assesses the effects of climate and the hydropower system on river flow and sediment transport, tests habitat availability predictions of the most detailed and up-todate hydrodynamic model of the estuary, evaluates biological and bioenergetic factors influencing salmonid rearing capacity, and evaluates population characteristics of juvenile salmon at various periods during the development of the CRE and Columbia River upstream (Bottom et al. 2001).

The Salmon at the River's End assesses the potential impact of flow regulation on juvenile salmon utilization of the estuary. The analyses identified flow regulation and climate

effects on hydrology and sediment transport, both of which have likely consequences for the estuarine physical environment. The study evaluated the capacity of the estuary to support salmon, including the effects of flow regulation on this capacity. Six analyses were completed and the results interpreted based on the relationships between habitat and salmon life histories.

The analyses indicated that habitat and food-web changes within the estuary and other factors affecting salmon population structure and life histories have altered the capacity of the estuary to support juvenile salmon. Diking and filling activities in the estuary have likely reduced the rearing capacity for fry and subyearling life histories by decreasing the tidal prism and eliminating emergent and forested wetlands and floodplain habitats adjacent to shore.

The study noted that while the risk of extinction of many Columbia River populations implies the need for immediate recovery action, lack of data on estuarine habitat use by salmon argues that further study may be necessary before we can define appropriate restorative measures. Both of these concerns can be addressed by initiating targeted restoration activities, where there is reasonable confidence in their ecological benefits, and by simultaneously collecting new data to better understand salmon habitat requirements and restoration needs.

3.2.82 *Salmon Steelhead Habitat inventory Assessment Program (SSHIAP)*

Lead: Washington Department of Fish and Wildlife, Northwest Indian Fisheries Commission

With help from partner organizations throughout the Pacific Northwest, SSHIAP collects information about habitat conditions and fish stocks and consolidates it into a single database. Computer-generated maps, based on the data, allow people to view salmon conditions over large areas, or find information on a single stream or tributary.

SSHIAP's growing database currently includes information about fish distribution, barriers to salmon migration (such as impassible culverts) and various habitat conditions throughout western Washington. Future plans include incorporating data on eastern Washington, estuarine conditions, and other information important to salmon recovery efforts.

SSHIAP uses a Geographic Information Systems (GIS) database that contains information on salmon stocks and habitat conditions for Washington's rivers and streams. SSHIAP presents this information in the form of computer- based maps at the 1:24,000-scale, based on data collected for each stream segment.

The Salmon Recovery Act, approved by the Washington State Legislature in 1998, requires that all information regarding habitat preservation and restoration projects be incorporated into the SSHIAP database along with salmon-monitoring data collected by local groups. Baseline information on salmon stocks is derived from the state's Salmonid Stock Inventory (SaSI), a statewide listing of salmon and steelhead stocks.

Managed jointly by the Northwest Indian Fisheries Commission and the Washington Department of Fish and Wildlife, SSHIAP also incorporates data provided by project partners throughout the Pacific Northwest. Protocols are being developed to ensure that data is scientifically sound and easy to access.

3.2.83 *Salmonid Population and Habitat Monitoring in the Oregon Portion of the Columbia Estuary (BPA #30018)*

Lead: Oregon Department of Fish and Wildlife

This project extends the structure and methods employed by the Oregon Plan for Salmon and Watersheds Monitoring Program (Nicholas, 1997a; 1997b; 1999) to Oregon's portion of the Lower Columbia Province (Willamette, Sandy, Lower Columbia Subbasins). This approach, successfully implemented in Oregon's coastal watersheds, applies a rigorous sampling design to answer key monitoring questions, provides integration of sampling efforts, and has greatly improved coordination among state, federal, and tribal governments, along with local watershed groups. This project proposes to monitor the status, trends, and distribution in adult coho and steelhead populations, juvenile salmonids populations, and the habitats they depend on at the Provincial and Subbasin scales. The project is high priority based on the elevated level of emphasis the NWPPC Fish and Wildlife Program and Subbasin Summaries, NMFS 2000 FCRPS Biological Opinion, and the Oregon Plan for Salmon and Watersheds have placed on monitoring and evaluation to provide the real-time data to guide restoration and adaptive management in the region.

3.2.84 *Sandy River Delta Plan and Eis 1996, and Watershed Analysis, 1995*

Lead: US Forest Service, Columbia River Gorge National Scenic Area

The Sandy River Delta was historically a wooded, riparian wetland with components of ponds, sloughs, bottomland woodland, oak woodland, prairie, and low and high elevation floodplain. It has been greatly altered by past agricultural practices and the Columbia River hydropower system. Restoration of historic landscape components is a primary goal for this land.

The Sandy River Delta comprehensive management plan envisions wetland, riparian forest, shrub-scrub, upland forest, and upland meadow restoration, with moderate recreation and natural resource interpretation. Riparian forest and wetland restoration were identified as first priorities. The long-term objectives are re-establishment of 600 acres of Columbia River bottomland riparian forest (dense stands of black cottonwood, will and ash), and re-establishment of about 200 wetland acres and associated upland habitat. Monitoring will evaluate restoration success. Breaching of levees and dikes can be considered to restore sloughs and backwater channels. Restoration of open upland areas (meadow/prairie) would follow substantial completion of the riparian and wetland restoration.

3.2.85 *Sandy River Watershed Riparian*

Lead: The Nature Conservancy

This project is the second year of a Sandy River watershed-wide, integrated restoration, outreach/education and youth leadership program. Although on-the-ground habitat restoration via removal of the highly invasive and system modifying weed, Japanese knotweed is the central focus, the project is designed to simultaneously increase community knowledge of watershed issues and citizen (especially youth) participation in the solution.

3.2.86 *Scappoose Bay Watershed Assessment*

Lead: Scappoose Bay Watershed Council, 2000

The purpose of this report is to provide a broad foundation for effective restoration of native fish species and their aquatic habitat in the Scappoose Bay watershed. The report follows the guidelines of the Oregon Watershed Enhancement Manual (WPN 1999). The Scappoose Bay Watershed Assessment presents the existing baseline information on watershed conditions (based on available reports and data) and oral history interviews. A Geographic Information System (GIS) was built to display, analyze and store much of the data. Habitat factors for the decline of

salmonids are compared, and major protection and restoration opportunities are identified and prioritized. This Phase I assessment does not generally provide the detailed field reconnaissance and comprehensive field studies that are necessary for proceeding with specific protection and restoration projects. Rather, this assessment lays out the groundwork for a second phase of assessment that bridges the gap between identifying major areas for action and conducting specific projects.

Although relatively small in size (85,000 acres), the Scappoose Bay watershed historically supported four of six species of salmon found in the Pacific Northwest. It contained a broad diversity of habitats, ranging from small, steep mountain streams to extended low-gradient stream valleys to the lowland floodplain of the Columbia River estuary. Over the past 150 years, the watershed has been impacted by a broad range of uses: agriculture, forestry, surface mining, and residential and industrial development. The dramatic decline in all species of salmonids in the watershed is not due to one or even several independent habitat-impacting activities, but rather to a complex interplay of activities that have degraded specific habitats used at particular times in the life histories of the fish. Included in this complex scenario is the effect of introduced hatchery fish and fishery management policies, as well as the shift to poor ocean conditions along the Oregon and Washington coasts throughout the 1980s.

3.2.87 *Skipanon, Youngs Bay, Nicolai Wickiup Watersheds Action Plans, May 2003*

Lead: Oregon Watershed Enhancement Board, Skipanon, Youngs Bay, Nicolai Wickiup Watershed Councils

This document represents the final report for the development of Action Plans for the Skipanon, Youngs Bay and Nicolai Wickiup watershed councils. The Action Plan is based on current information contained in the 2000 Skipanon, Youngs Bay, and Nicolai Wickiup Watershed Assessments.

The watershed health and council priority issues identified through the action plan and by utilizing Watershed Assessments include: fish passage, riparian and estuarine habitat, water quality/quantity, watershed monitoring, and education and outreach. The Action Plan recommends ways to enhance watershed conditions through implementation of action opportunities identified in watershed subbasin summaries. The document was submitted to OWEB in May 2003 and was revised to incorporate comments from OWEB

3.2.88 *Status Assessment and Conservation Recommendations for the Caspian Tern (Sterna Caspia) in North America*

Lead: US Fish and Wildife Service - August 2002

Despite recent population increases, the Caspian Tern (Sterna caspia) is of conservation concern in the Pacific Northwest because of the concentration of breeding terns at relatively few sites and fisheries conflicts at the Columbia River estuary, where currently two-thirds of the Pacific Coast and one-quarter of the North American population occurs. Although not listed at the national level, the species currently is listed as threatened or endangered in three states or provinces and is considered of special concern in ten more. The Caspian Tern still occupies most of its historic range and has expanded slightly into new areas.

Historically the Caspian Tern suffered from harvest for the millinery trade, egging, human disturbance, habitat loss at interior wetlands, and, more recently, from contaminants. Historic population numbers are unknown but appear to have been substantially reduced early in

the century. Relatively accurate population data for the Caspian Tern in North America were unavailable until the late 1970s, when concerns over coastal habitat modification and offshore oil development prompted national multi-species surveys of colonial nesting waterbirds. Estimates of the U.S. breeding population were roughly 9,454 pairs in the mid-1970s to early 1980s and 20,948 pairs in the late 1980s to late 1990s. Since the late 1970s, the population has increased in four of five major breeding regions in North America, and the continental population is estimated to be a minimum of 32,000 to 34,000 pairs, distributed differentially among regions: Pacific Coast/Western (interior) (45%), Central Canada (28%), Great Lakes (19%), Gulf Coast (7%), and Atlantic Coast (<1%).

Continentwide population increases were fueled initially by the reduction or elimination of some historic pressures (e.g., hunting for millinery trade) but more recently by changes in breeding habitat and prey resources. Occupation of relatively stable artificial habitats (e.g., dredge spoil islands) has greatly concentrated the tern population leaving it more vulnerable to stochastic events, such as disease outbreaks, severe storms, disruption by predators or human disturbance, and oil spills. Caspian Tern population increases in the Pacific region from the mid-1980s to 2001, primarily in the Columbia River estuary, may largely reflect the crucial juxtaposition of stable human-created habitats in conjunction with a predictable food supply. Human exploitation of native fish communities leading to dominance of small fish species favored by foraging terns appears to be a significant factor in tern increases in the Great Lakes and central Canada.

Conservation efforts will be most effective if focused on multiple fronts including monitoring tern populations, resolving management conflicts with other species by addressing root causes, reducing risks to the tern population by distributing breeding colonies among a greater number of sites, filling gaps in knowledge of biology and threats on migration and the wintering grounds, and educating the public about the value of colonial waterbirds and possible effects of human actions on Caspian Terns.

3.2.89 *Steigerwald Lake National Wildlife Refuge*

Lead: USFWS, Steigerwald Lake National Wildlife Refuge

The Steigerwald Lake National Wildlife Refuge is part of the Ridgefield National Wildlife Refuge Complex located in southwest Washington. It consists of more than 950 acres of historic lakebed and river bottomland habitat with wetlands, riparian areas, grasslands and hardwood forest. The refuge provides habitat for wintering waterfowl and year-round habitat for a variety of wildlife species.

The refuge development and management efforts aim to:

- Restore natural, dynamic stream/river systems, including their associated in-water and riparian habitats for anadromous fish, breeding neotropical birds and other native fish and wildlife.
- Provide wetland and cropland/grassland habitats for feeding and resting by migrating and wintering ducks, geese, cranes and other migratory birds and for reducing crop depredation on private lands.
- Preserve, enhance and protect habitats that support endangered species, threatened species and species of special concern.

- Provide opportunities for quality, wildlife-dependent recreation, education and research to enhance public appreciation, understanding and enjoyment of refuge fish, wildlife and habitats.
- Preserve designated cultural resources.

The Ridgefield National Wildlife Refuge Complex is comprised of five refuges located in the southwest part of the state of Washington: Ridgefield north of Vancouver; Conboy in the southcentral part of the state; and Franz Lake, Pierce and Steigerwald Lake all located in the Columbia River Gorge.

3.2.90 *Support Local Salmon Corps Projects*

Lead: CRITFC

The Salmon Corps receives independent funding from NOAA/NMFS to implement habitat restoration projects funded under the PCSRF. Projects selected by the Salmon Corps will be salmon-related habitat restoration projects in the Lower Columbia River. CRITFC will cost-share with this program to assist in project implementation and inter-agency coordination. Other participants in this program include the Native American Youth Association (NAYA) and the Lower Columbia River Estuary Partnership (LCREP). Two Native American interns will be hired by CRITFC to coordinate project implementation, collect environmental data and write a monitoring and evaluation report.

3.2.91 *Survival and Growth of Juvenile Salmonids in the Columbia River Plume (BPA # 199801400)*

Lead: National Marine Fisheries Service

This project evaluates the role of the Columbia River plume in survival of juvenile salmon through long-term observations, fine-scale process studies, retrospective assessments, and modeling to assess management of flow to improve habitat opportunity.

The project characterizes, over an extended period, the physical and biological features of the nearshore ocean environment using mesoscale and fine scale oceanographic surveys, develops coupled physical-biological models and performs retrospective assessment of the Columbia River plume as it interacts with coastal circulation. With a new understanding of salmon-plume-coastal circulation interactions, the project will develop a set of hydropower management scenarios that could benefit survival, growth, and health of juvenile salmon by changing the dynamics of the Columbia River plume.

The nearshore ocean environment, particularly that associated with the Columbia River plume, is a critical habitat to outmigrating juvenile salmon. Recent evidence suggests that improvement in survival of the estuarine and early ocean life history phase of Columbia River salmon may be critical to recovery of endangered stocks. In the case of salmonids originating in the Columbia River Basin, survival success hinges on the complex interaction of smolt quality and the abiotic and biotic ocean conditions at the time of entry and during their first year of ocean existence.

This project hypothesizes that variation in the physical and biological conditions of the nearshore environment, particularly that associated with the plume, affects overall survival of Columbia River stocks. It further hypothesizes (a) that primary factors driving the variation in the nearshore and plume environment include oceanographic and land-based (river flow) processes modulated by climatic and anthropogenic factors, (b) that trophic relationships

modulated by these physical variations affect growth and survival of juvenile salmon and (c) that management of the hydropower system can be used to regulate the Columbia River plume habitat to benefit salmon growth and survival.

3.2.92 *Washington and Oregon Eulachon (Columbia River Smelt) Management Program*

Lead: Washington and Oregon Departments of Fish and Wildlife

The Washington and Oregon Departments of Fish and Wildlife conduct a small scale program of monitoring sport and commercial eulachon (Columbia River smelt) fisheries and sampling for eulachon eggs and larvae in the mainstem lower Columbia River and tributaries to index run size and to identify the extent and distribution of spawning activity.

Sampling has demonstrated that the number of eulachon returning each year varies and the number of tributaries and portions of the mainstem Columbia River use for spawning also varies from year to year. Occasionally, a portion of the run travels to and sometimes passes above Bonneville Dam, presumably in an attempt to spawn in pre-impoundment spawning sites.

The goal of the Oregon and Washington eulachon management program is to maintain healthy populations of eulachon returning annually to spawn in the mainstem Columbia River and tributaries. The primary strategy involves estimating run size and regulating fisheries to only harvest excess surplus. The magnitude of spawning is indexed through sampling for eulachon eggs and larvae at a small number of selected sites.

3.2.93 *Washougal River: Slough Creek Riparian*

Lead: Washington State Parks

Project funding is for acquisition of high quality salmon rearing habitat and cold-water refuge and spawning beds for steelhead, sea-run cutthroat, chinook and coho salmon along portions of Slough Creek and the Washougal River in Clark County. Approximately 18 acres and 2,800 lineal feet of high quality riparian habitat that is highly threatened by development will be secured through purchase and donation of a conservation easement. Project supporters include WDFW, the Camas-Washougal Wildlife League, and Habitat Partners. Protection of this land will prevent future development and destruction of riparian vegetation and habitat conditions. This property is immediately downstream from over 400 acres and 8,000 lineal feet of high quality habitat that will be acquired and protected by WDFW, ensuring greater protection of this investment.

3.2.94 *Western Washington Columbia River Tributaries Watershed Analysis*

Lead: USDA Forest Service Columbia River Gorge National Scenic Area 2001

This analysis, completed in 2001 by the USDA Forest Service, describes the land uses and management within the Columbia River Gorge National Scenic Area. The Management Plan (CRGNSA) provides a Recreation Intensity Class (RIC) overlay to the underlying land use designations for maximum habitat protection. It explains that in the Columbia River watershed, the Northwest Forest Plan (NFP) applies to the National Forest lands in the CRGNSA and Gifford Pinchot National Forest (GPNF). The NFP describes Land Allocations meant to protect habitat areas.

Land use direction for the Columbia River comes from three management plans: the Columbia River Gorge National Scenic Area Management Plan, the Gifford Pinchot National

Forest Land and the Resource Management Plan. The most protective guidelines in the watershed give precedence to fish and wildlife protection.

3.2.95 *Wetlands Functional Assessment, City of Vancouver Marine Park*

Lead: City of Vancouver Water Resources Education Center, 2001

This functional assessment, completed in 2001, summarizes findings and reviews provided by a joint city/community advisory committee and stakeholder forums from neighbors and other citizens. The management plan will specify objectives and address opportunities for wetlands enhancement that continue to protect high habitat values.

The objective is to protect high quality habitat while providing education and passive recreation opportunities compatible with habitat functions.

3.2.96 *White Sturgeon Mitigation and Restoration in the Columbia and Snake Rivers Upstream from Bonneville Dam*

Leads: Washington Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, U.S. Geological Survey

WDFW, ODFW and USGS have been studying impounded white sturgeon populations since 1987. The studies have involved many activities, including sampling for sturgeon eggs, larva, and young-of-the-year (YOY) to measure natural production. Recruitment failures (lack of YOY) were documented during years when hydrosystem operation reduced spring/summer flows. Reduced population productivity has negatively impacted ongoing tribal and sport fisheries. Supplementation experiments were conducted to identify possible mitigation measures, including transporting juvenile white sturgeon from the unimpounded lower Columbia River (the reach within the Lower Columbia Province) upstream to The Dalles and John Day reservoirs

Transporting white sturgeon from the unimpounded lower Columbia River was adopted as a mitigative measure to address the negative impact that hydrosystem operation has had on natural production of impounded populations. The removal of over 26,000 white sturgeon and the planned removal of 5,000-10,000 juvenile fish annually for an unspecified number of years will have an impact on the white sturgeon population residing in the Lower Columbia Province.

The goal of the transport program is to replace small or missing year classes in order to rebuild recruitment to fisheries and to broodstock. Progress is being measured by conducting intensive stock assessments every five years. Annual natural production is being indexed annually.

3.2.97 *Wood's Landing Chum Spawning Site Protection, City of Vancouver (BPA#31006)*

Lead: City of Vancouver

The project will protect the largest Lower Columbia River chum production site between the Grays River near the mouth of the Columbia River and Hardy/Hamilton Creeks just below Bonneville Dam. Federal, state, and regional reports including the Federal Columbia River Power System Biological Opinion and the Lower Columbia Subbasin Summary, have described the importance of good chum spawning habitat in the Lower Columbia.

Through acquisition the project will protect the area, 11.96 acres and 1000 feet of shoreline, above this significant chum spawning habitat on the Columbia River shore in

Vancouver, Washington. The properties include tidelands and mostly forested upland areas with very good riparian habitat. The current zoning allows 1 unit per 10,000 square feet (0.23 acres). Such residential development degrades habitat by increasing pollutant loading and bringing people and pets that disturb the spawning chum and their eggs.

Restoration of 350 feet of the Joseph's Creek, which enters the Columbia River immediately downstream of the main stem spawning site, will provide additional spawning habitat. The restoration will include adding spawning gravel, removing invasive plants from the banks, and stabilizing and revegetating the banks.

Partners in the project are Washington Department of Fish and Wildlife, Columbia Land Trust, City of Vancouver and the Wood family members who own the property. All partners share salmon conservation goals. Washington Department of Fish and Wildlife will develop a management plan in cooperation with the partners. Columbia Land Trust will manage the acquisition and then give the title and easements to Washington Department of Fish and Wildlife. The project provides a unique opportunity within the Lower Columbia subbasin to protect existing, critical, high quality chum salmon habitat in the main stem.

3.2.98 *Wood's Landing Chum Spawning Site Protection, Clt*

Lead: Columbia Land Trust

This acquisition project will protect the largest Lower Columbia River chum production site between the Grays River near the mouth of the Columbia River and Hardy/Hamilton Creeks just below Bonneville Dam. The project will protect 6.78 acres and 600 feet of shoreline, immediately above this significant chum spawning habitat in Vancouver, Washington. The properties are mostly forested with excellent riparian habitat. Without the proposed acquisition, the threat of residential development of the site in the near future is very high.

3.2.99 *Working Implementation Plan for Bald Eagle Recovery in Oregon and Washington, July 1990*

Lead: Bald Eagle Working Team for Oregon and Washington, (of OR-WA Interagency Wildlife Committee, Washington Department of Wildlife)

The purpose of this Implementation Plan is to provide state and federal agencies, private individuals and organizations, and conservation groups with specific guidance to fulfill bald eagle recovery goals within Recovery Zones in Oregon and Washington.

The first section of the Plan describes situations (needs or problems) to be addressed and lists tasks to be accomplished as well as Leaders and Cooperators for each task. The second section includes Tables, Figures, and Appendices which summarize the results of the completed tasks and are devices for guiding and tracking progress towards recovery.

The situations listed are as follows:

- monitoring nesting populations
- monitoring winter populations
- habitat management plans
- acquisition
- research needs: human activities
- research needs: foraging ecology
- research needs: contaminants

- information and education

The Pacific Bald Eagle Recovery Plan (USFWS, 1986) provides detailed background information on bald eagles and reviews and evaluates their status in the 7-state Pacific recovery area. The Recovery Plan is the basis for this Implementation Plan and states that the primary objective of the recovery process is, ". . .to provide secure habitat for bald eagles. . . and to increase population levels in specific geographic areas to the extent that the species can be delisted."

3.2.100 *Wy-Kan-Ush-Mi Wa-Kish-Wit Spirit of the Salmon the Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes*

Leads: the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes

The Spirit of the Salmon, completed in 1995 by the Columbia River Intertribal Fish Commission, provides a framework to restore the Columbia River salmon, simply stated: put the fish back into the rivers. According to Spirit of the Salmon, past attempts to maintain or restore declining salmon numbers all assumed that technology alone could "fix" the damage caused by disregard for the underlying, interconnected processes of nature which gave rise to and sustained the great salmon runs of the Columbia Basin. Simple solutions could not replace the complexity of nature; naturally these attempts failed. Accomplishing this requires a common understanding of habitat requirements of salmon relative to the present conditions they face in the Columbia River Basin.

Its goals include:

- Restore anadromous fish to the rivers and streams that support the historical, cultural and economic practices of the tribes. (These are generally areas above Bonneville Dam.)
- Emphasize strategies that rely on natural production and healthy river systems to achieve this goal.
- Protect tribal sovereignty and treaty rights.
- Reclaim the anadromous fish resource and the environment on which it depends for future generations.
- Objectives:
- Halt the declining trends in salmon, sturgeon and lamprey populations originating upstream of Bonneville Dam within seven years.
- Increase the total adult salmon returns of stocks originating above Bonneville Dam to 4 million annually and in a manner that sustains natural production to support tribal commercial as well as ceremonial and subsistence harvests within 25 years.
- Increase sturgeon and lamprey populations to naturally sustainable levels that also support tribal harvest opportunities within 25 years.
- Restore anadromous fish to historical abundance in perpetuity.

3.2.101 *Youngs Bay, Nicolai-Wickiup River and Skipanon River Watershed Assessments*

The purpose of these watershed assessments, completed in 1999, is to inventory and characterize watershed conditions of the Youngs Bay, Nicolai-Wickiup and Skipanon River

watersheds and to provide recommendations that address the issues of water quality, fisheries and fish habitat, and watershed hydrology. These assessments were conducted by reviewing and synthesizing existing data sets and some new data collected by the watershed council, following the guidelines outlined in the Oregon Watershed Enhancement Board (OWEB) watershed assessment manual (WPN 1999).