

Appendix G.1: Restoration Plan

Introduction

Degraded areas from the Inventory and Analysis have been identified including those with impaired ecosystem processes and ecological functions. Of the areas identified those which have a high potential for restoration opportunities have been mapped.

Overall Goals and Priorities

The governing principals of the shoreline update guidelines require cities and counties containing shorelines with impaired ecological functions to provide goals and policies to guide the restoration of those impaired shorelines. The regional shoreline staff and advisory committee compiled a list of potential restoration sites using data obtained during the inventory phase of the master program update, which identified impaired shoreline areas. Ongoing restoration efforts were included with the inventoried sites to create a comprehensive list of potential restoration opportunities. General and specific goals and policies have been developed and are listed below to address restoration of these various areas.

Restoration Techniques

Table 1. The following provides a list of techniques that are available for shoreline restoration by focusing on enhancement of natural functions

Opportunities	Process Description	Specific techniques (examples)
Reconnect access to floodplain	Isolated habitats- off channel/side channel, channel cutoffs, avulsion areas, wetlands, and oxbow lakes, areas isolated by instream barriers (culverts) or other artificial obstructions.	Remove anthropogenic instream barriers by culvert modification, levee breaching; excavating new ponds and wetlands, enhance instream processes, and reconnect channel and floodplain function
	Off-channel/ side channel - alcoves, ponds, wetland, seasonally flooded areas that are still in connection. Usually these off-channel habitats are altered by agriculture, urban land use, flood control, and roads.	Use instream enhancement structures to improve channel connectivity and habitat conditions

<p>Enhance hydrologic and sediment processes</p>	<p>Enhance natural timing, frequency, and duration of peak flows and low flows, and redirect flows to enhance natural processes.</p> <p>Restores sediment process functions that deliver coarse and fine sediment to the aquatic system.</p>	<p>Road improvement : removal, upgrade stream/culvert crossings, reduce road drainage to stream, use natural systems engineering techniques to protect infrastructure and improve/ enhance habitat and ecosystem function, traffic reduction; decommissioning of forest roads</p> <p>Riparian Enhancement: fencing¹, reforestation, conifer conversion² wetland restoration impervious surface reduction</p>
<p>Nutrient enhancement</p>	<p>Primary productivity increases with nutrients and provides multiple benefits to the capacity and diversity of the aquatic food web.</p>	<p>Carcass placement, stream fertilization, LWD and engineered log structures</p>
<p>Instream habitat enhancement</p>	<p>Over time, watershed process will restore channel complexity naturally, but the installation of channel structures may be necessary to increase habitat quality as a near-term action.</p>	<p>Log structures, natural LWD placement, engineered log jams, boulder placement, channel reconfiguration, channel roughness elements, floodplain enhancement structures</p>

1 Exclude livestock: grazing can alter natural riparian and channel processes, increase streambank erosion, channel sedimentation and widening, increase stream temperature due to reduced natural vegetation, decrease stream water quality (Elmore and Beschta 1987; Platts 1991).

2 A long-term opportunity is the concept of conifer conversion in areas where hardwoods have replaced the natural conifer vegetation. However, little scientific information exists since this takes decades to 100 years. (Emmingham et al. 2000).

Prioritization

Prioritization is based on a number of factors, including the needs of individual species, locations of refugia, and cost-effectiveness, response time of techniques, and the probability of success (Beechie and Bolton 1999). Those techniques that have a high probability of success, low variability among projects, and relatively quick response time should be implemented before other techniques. In general, reconnect high-quality isolated habitats, then riparian enhancements, and lastly road restoration.

Roni et al., 2002 described a methodology for prioritizing site-specific restoration strategies in a watershed. This methodology describes three key knowledge components needed to prescribe appropriate site-specific restoration, principles of watershed processes, protection of existing high-quality habitats, and the current knowledge of the effectiveness of specific natural system engineering techniques such as placement of engineered log jams and instream channel roughness elements. While the state of the science on the use of this approach is recent, examples from the past three years include

work within the Elwha, Yakima, Nooksack, Quinault river systems. It is recommended that shoreline enhancement projects should include a monitoring plan.

Goal

The goal of restoration is to achieve a net gain in shoreline ecological functions by providing for the timely repair and rehabilitation of impaired shorelines through a combination of public and private programs and actions.

Objectives

- Restoration projects shall be designed with the intent to achieve no net loss of ecological functions.
- Encourage cooperation between public agencies, private property owners, citizens, and volunteer groups for restoration projects.
- Facilitate restoration by expediting and simplifying the shoreline permit process for projects that are conducted solely for restoration purposes.
- Encourage public education of shoreline function and ecology in conjunction with restoration projects.

Policies

- Restoration and enhancement of shorelines should be designed using principles of landscape and conservation ecology and should restore or enhance chemical, physical, and biological watershed processes that create and sustain shoreline habitat structures and functions.
- Mitigation associated with shoreline development projects shall be designed and to achieve no net loss of ecological function.
- The county shall seek funding from state, federal, private and other sources to implement restoration, enhancement, and acquisition projects.
- Develop review guidelines that will streamline the review of restoration only projects.
- Encourage public and private shoreline owners to promote the proliferation of native, noninvasive wildlife, fish and plants.
- Restoration projects shall be coordinated with local public utility and conservation districts.
- Ensure that long-term maintenance and monitoring of restoration sites is included in the original permitting of the project.
- Allow for the use of tax incentive programs, mitigation banking, restoration grants, land swaps, or other programs, as they are developed to encourage restoration of shoreline ecological functions and protect habitat for fish, wildlife and plants.
- Jurisdictions shall pursue the development of a public benefit rating system that provides incentives for the restoration of the shoreline.
- Jurisdictions shall coordinate with state resource agencies to develop educational materials which promote the maintenance and restoration of shoreline functions.

- Educational materials shall provide resources for a variety of scenarios and trends occurring within the shorelines that are reflected in the inventory and analysis, such as: the conversion of agricultural land to non-agricultural use, existing and ongoing agricultural uses, and existing or planned residential and commercial development.
- Encourage the agricultural industry to continue to work closely with agencies, such as the Natural Resource Conservation Service and Okanogan Conservation District, with expertise in agricultural practices and restoration to improve degraded shoreline functions.

Timelines and funding

Multiple entities are responsible for systematically identifying, securing funding, designing, and constructing projects that provide regionally important watershed scale improvements to water quality and habitat improvements. The funding and timing with respect to design and construction of potential restoration projects is a continuous process.

Existing Efforts and Ongoing Programs

This section lists the programmatic measures within Okanogan County designed to foster shoreline restoration, achieve a no-net loss in shoreline and upland ecological processes, functions and habitats. There are many programs in place that occur in Okanogan County that are related to Natural Resource Conservation Service or Conservation District programs. The jurisdictions do not anticipate leading most restoration projects or programs. However, the SMP represents an important vehicle for facilitating and encouraging restoration projects and programs that could be led by public, private and/or non-profit entities.

Federal Programs

NATURAL RESOURCES CONSERVATION SERVICE

Agricultural Management Assistance – is a voluntary effort for agricultural producers, that provides cost share payments to construct or improve water management structures or irrigation structures; to plant trees for windbreaks or to improve water quality; and to mitigate risk through production diversification or resource conservation practices, including soil erosion control, integrated pest management, or transition to organic farming. Not currently available in Washington.

Conservation Reserve Enhancement Program (CREP) – is a joint partnership between the state of Washington and U.S. Department of Agriculture (USDA) that is administered by the Washington State Conservation Commission and the Farm Services Agency (FSA). The agreement was signed in 1998 and provides incentives to restore and improve salmon and steelhead habitat on private land. The program is voluntary for

landowners; the land enrolled in CREP is removed from production and grazing under ten- or 15-year contracts. In return, landowners plant trees and shrubs to stabilize the stream bank and to provide a number of additional ecological functions. Landowners receive annual rent, incentive and maintenance payments and cost share for practice installations. These payments made by FSA and the Conservation Commission can result in no cost to the landowner for participation.

Conservation Reserve Program – provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers and ranchers in complying with federal, state, and tribal environmental laws, and encourages environmental enhancement. The program is funded through the Commodity Credit Corporation (CCC). CRP is administered by the FSA, with National Resources Conservation Services (NRCS) providing technical land eligibility determinations, Environmental Benefit Index Scoring, and conservation planning.

Comprehensive Nutrient Management Plans (CNMPS) – helps Animal Feeding Operations owners and operators to achieve their production and natural resource conservation goals through development and implementation of CNMPS.

Conservation of Private Grazing Land Program – is authorized by the conservation provisions of the Federal Agricultural Improvement and Reform Act (1996 Farm Bill). The intent of this provision is to provide accelerated technical assistance to owners and managers of grazing land. The purpose is to provide a coordinated technical program to conserve and enhance grazing land resources and provide related benefits to all citizens of the United States. Currently, funds have not been appropriated for this program. However, the 2002 Farm Bill mandates establishment of a separate funding line-item for this purpose.

Emergency Watershed Protection (EWP) Program – helps protect lives and property threatened by natural disasters such as floods, hurricanes, tornadoes, and wildfires. The program is administered by the NRCS, which provides technical and financial assistance to preserve life and property threatened by excessive erosion and flooding. EWP provides funding to project sponsors for such work as clearing debris from clogged waterways, restoring vegetation, and stabilizing riverbanks. The measures that are taken must be environmentally and economically sound and generally benefit more than one property owner. NRCS provides up to 75 percent of the funds needed to restore the natural function of a watershed. The community or local sponsor of the work pays the remaining 25 percent, which can be provided by cash or in-kind services.

Environmental Quality Incentives Program (EQIP) – provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial manner. The program provides assistance to farmers and ranchers in complying with federal, state, and tribal environmental laws, and encourages environmental enhancement. The EQIP program is funded through the CCC. The purposes of the program are achieved through the

implementation of an EQIP plan of operations, which includes structural and land management practices on eligible land. Contracts of up to ten years are made with eligible producers. Cost-share payments may be made to implement one or more eligible conservation practices, such as animal waste management facilities, terraces, filter strips, tree planting, and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices, such as nutrient management, pest management, and grazing land management.

Farmland Protection Program – provides matching funds to help purchase development rights to keep productive farm and rangeland in agricultural uses. Working through existing programs, the U.S. Department of Agriculture (USDA) partners with state, tribal, or local governments and non-governmental organizations to acquire conservation easements or other interests in land from landowners. USDA provides up to 50 percent of the fair market easement value. To qualify, farmland must: be part of a pending offer from a state, tribe, or local farmland protection program; be privately owned; have a conservation plan for highly erodible land; be large enough to sustain agricultural production; be accessible to markets for what the land produces; have adequate infrastructure and agricultural support services; and have surrounding parcels of land that can support long-term agricultural production. Depending on funding availability, proposals must be submitted by the eligible entities to the appropriate NRCS state office during the application window.

Wetlands Reserve Program – is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The USDA's NRCS provides technical and financial support to help landowners with their wetland restoration efforts. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection. The program offers three enrollment options:

- Permanent easement – conservation easement in perpetuity. This program pays the lowest of either agricultural value of land, established payment cap, or an amount offered by the landowner and pays 100 percent of wetland restoration costs.
- Thirty-year easement – 75 percent of permanent easement and 75 percent of restoration costs.
- Restoration cost-share agreement – agreement to re-establish degraded or lost wetlands for minimum of 10 years. The program pays 75 percent of the restoration costs.

Wildlife Habitat Incentives Program (WHIP) – is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Through WHIP, USDA's NRCS provides both technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. WHIP agreements between NRCS and the participant generally last from five to ten years from the date the agreement is signed. The 2002 Farm Bill provides for up to 15 percent of annual WHIP funds for increased cost-share payments to producers using agreements with a duration of at least 15 years.

U.S. FISH AND WILDLIFE SERVICE

North American Wetlands Conservation Fund – has funds for local governments with at least a 50 percent match to: (1) acquire real property interest in lands or waters, including water rights, if the obtaining of such interest is subject to terms and conditions that will ensure that the real property will be administered for the long-term conservation of such lands and waters and the migratory birds and other fish and wildlife dependent thereon; and (2) restore, manage, or enhance wetland ecosystems and other habitat for migratory birds and other fish and wildlife species if such restoration, management, or enhancement is conducted on lands and waters that are administered for the long-term conservation of such lands and waters and the migratory birds and other fish and wildlife dependent thereon. Further, funds from the Coastal Wetlands Planning, Protection, and Restoration Act may only be used in coastal wetlands ecosystems in coastal states.

National Coastal Wetlands Conservation Grant Program – is a program to acquire, restore, and enhance wetlands of coastal states and the trust territories has been established by the Coastal Wetlands Planning, Protection, and Restoration Act. Since enactment of the law in 1990, the NRCS has been working with the states to acquire, restore, manage, or enhance coastal wetlands through a matching grants program.

Cooperative Conservation Initiative – has funds available to support efforts to restore natural resources and establish or expand wildlife habitat. The program pays up to 50 percent.

Private Stewardship Grants – provides grants or other assistance on a competitive basis to individuals and groups engaged in private conservation efforts that benefits species listed or proposed as endangered or threatened under the Endangered Species Act, candidate species, or other at-risk species on private lands within the United States. The program pays up to 90 percent.

Cooperative Endangered Species Conservation Fund (Recovery Land Acquisition Grants) – is authorized under the Endangered Species Act. This fund provides grants to states and territories to support their participation in a wide array of voluntary conservation projects for listed species, as well as for species either proposed or candidates for listing. By law, the state or territory must contribute 25 percent of the estimated program costs of approved projects, or 10 percent when two or more states or territories undertake a joint project. One of the three grants available is the Recovery Land Acquisition Grants (\$17.8 million). These grants provide funds to states and territories for acquisition of habitat for endangered and threatened species in support of approved recovery plans.

BONNEVILLE POWER ADMINISTRATION

Wildlife Mitigation for the Federal Columbia River Power System – provides funding to acquire fish and wildlife habitat above Bonneville Dam.

BUREAU OF RECLAMATION

National Fish and Wildlife Foundation – the environmental restoration challenge grants program uses challenge grants, where recipients match funds, to encourage partnerships among federal agencies, tribes, state and/or local governments, nonprofit

organizations, and individual landowners. The program offers reclamation awards grants for on-the-ground efforts to recover or conserve endangered or sensitive fish, plant, and wildlife species; restore riverine, wetland, riparian, or upland habitats; improve water quality; and control noxious weeds. All projects receiving reclamation funds must be connected to the waters or lands the Bureau of Reclamation administers.

Yakima River Basin Water Enhancement Project – the \$200 million project to address the problem of declining fish populations includes funding for restoring and repairing riparian habitat and acquiring land along the Yakima River.

State Programs

WASHINGTON STATE CONSERVATION COMMISSION

Conservation Reserve Enhancement Program – a joint partnership between the state of Washington and USDA that is administered by the Washington State Conservation Commission (WSCC) and the FSA. See Federal programs above.

Conservation Easements program (SHB 2754) – the WSCC is creating a Washington purchase of agricultural conservation easements program that will facilitate the use of federal funds, ease the burdens of local governments launching similar programs at the local level, and help local governments fight the conversion of agricultural lands.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Water Quality Financial Assistance – The state Department of Ecology administers funding from three programs:

- The Centennial Clean Water Fund (Centennial), which provides low-interest loans and grants for wastewater treatment facilities and fund-related activities to reduce nonpoint sources of water pollution.
- The State Revolving Loan Fund (SRF), which provides low-interest loans for wastewater treatment facilities and related activities, or to reduce nonpoint sources of water pollution.
- The Section 319 Nonpoint Source Grants Program (Section 319), which provides grants to reduce nonpoint sources of water pollution.

Examples of the type of projects that they have funded in the past:

- Planning, design, and construction of wastewater and stormwater treatment facilities.
- Agricultural best management practices projects.
- Stream and salmon habitat restoration.
- Local loan funds for water quality projects.
- Watershed planning.
- Water quality monitoring.
- Water reuse planning and facilities.
- Lake restoration.
- Wellhead protection.
- Acquiring wetland habitat for preservation.
- Construction of public boat pump-outs.

- Public information and education.

SALMON RECOVERY FUNDING BOARD

Salmon Recovery Funding Board (SRFB) – grants to provide funding of habitat protection and restoration projects and related programs and activities that produce sustainable and measurable benefits for fish and their habitat. Local governments, private landowners, conservation districts, Native American tribes, non-profit organizations, and special purpose districts are eligible to receive funding. Private landowners are eligible applicants only when the project takes place on their own land. All projects must come through the local lead entity group and a Technical Advisory Group to the SRFB for final funding decisions.

INTERAGENCY COMMITTEE ON OUTDOOR RECREATION

Washington Wildlife and Recreation Program – funds for municipal subdivisions, tribes, and state agencies in seven categories, including critical habitat and natural areas. They must be able to document at least a 50 percent match in funding for a project.

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Aquatic Land Enhancement Grants – grants to state agencies, tribes, and local governments. The project sponsor must document a minimum 50 percent match in funds. Eligible projects must be associated with navigable waters and are limited to aquatic habitat acquisition projects (including conservation easements), restoration projects, and public access and development projects. Acquisition projects have first priority and restoration projects second priority.

Local Government Programs

Comprehensive Land Use Plan Policies – Policies in the plan requiring use of incentive programs to encourage water quality and habitat protection.

Land Acquisition or Purchase of Conservation Easements – County and city programs for acquisition funded by conservation futures or other local funding sources and federal and state.

Long-Term Lease – Land trust/governmental agency leases property from the landowner, thereby preventing other uses of the property during the lease term.

Restoration of Habitat Projects – Projects to create fish passage at culverts, restore estuaries, etc., with conservation futures or other local funding sources and federal and state funding noted above.

Purchase of Development Rights – Okanogan County may develop in the future, a program that would allow the purchase of development rights if allowed under current zoning from the landowner with conservation futures or other local, state, or federal funding sources.

Transfer of Development Rights – Okanogan County may develop a program in the future whereby development rights may be transferred from agricultural land to an area

where higher densities are encouraged.

Management Program	Sponsor/Lead Agency	Area affected by Program	Goal of the Program	Does the Program Support or Threaten ESA Species?
Water Management Program	Bonneville Power Administration	Upper Columbia Basin	Establish prescriptions that apply to watershed mitigation projects	Supports—Should improve aquatic and riparian habitats
Pollution Prevention and Abatement Program	Bonneville Power Administration	Upper Columbia Basin	Coordinate the management and disposal of wastes generated as a result of BPA work practices	Supports—Prevents pollutants and wastes from entering aquatic habitats.
Natural Resources Program	Chelan and Okanogan Counties	Upper Columbia Basin	Administer watershed planning and salmon recovery efforts in the basin.	Supports—Improves watershed condition and supports recovery of listed species.
Water Conservation Loan Program	Chelan County and Okanogan Conservation District	Wenatchee and Entiat Subbasins	Provide incentives to install water-efficient irrigation systems.	Supports—Improves instream flow conditions for fish.

Conservation Securities Program	NRCS	All agricultural operations on private croplands, rangeland, pasture land, and orchards in Douglas County	Voluntary program providing financial reward to eligible agricultural operations for stewardship and enhancement practices and activities	Benign—Should have little to no effect on habitat conditions in streams.
Watershed Management Act (2514)	Okanogan County Conservation District	48, 49,	Enables the development of planning units that conduct watershed planning and recommend management strategies.	Supports—Should improve aquatic habitat conditions for fish.
Critical Areas Ordinances (CAO)-Wetlands Chapter 14.12	Okanogan County	County building and development but not agricultural practices	Prevent cumulative adverse environmental effects on water quantity and quality, groundwater, wetlands, and rivers and streams.	Supports—Should protect aquatic habitat conditions for fish.
CAO-Fish and Wildlife Conservation Chapter 14.12	Okanogan County	County building and development but not agricultural practices	Protect unique, fragile, and valuable elements of the environment.	Supports—Should protect aquatic habitat conditions for fish.
CAO-Frequently Flooded Areas Chapter 14.12	Okanogan County	County building and development but not agricultural practices	Promotes public health, safety, and welfare by minimizing public and private losses due to flood conditions.	Benign/Threaten—May reduce habitat diversity by reducing off-channel habitat and floodplain conditions.
CAO-Geohazards Chapter 14.12	Okanogan County	County building and development but not agricultural practices	Protects the general public and resources from flooding, landslides, or steep-slopes failure.	Benign/Threaten—May reduce habitat diversity by reducing off-channel habitat and floodplain conditions.
Shoreline Master Plan	Okanogan County	Shorelines of the state within Okanogan County	New program designed to conserve and enhance anadromous fish resources.	Supports—Should protect and enhance the aquatic habitat of fish.

Subdivision Title 17.04.020	Okanogan County	Rural Counties	Establishes an exemption level of administrative review of property at 20 acres.	Benign/Threaten—At the 20 acre exemption level, no environmental review occurs. Also may lead to clustering and dividing into smaller lots along shorelines (near urban-scale density development in rural areas).
Six Year Transportation Plan	Okanogan County	Stormwater drainage and management	Review transportation programs for consistency with the Counties Comprehensive Plans.	Supports—Should protect aquatic habitat for fish.
Upper Columbia Regional Fisheries Enhancement Group (RCW 77.95)	Chelan, Douglas, and Okanogan Counties	Upper Columbia Basin	Enhance salmon and steelhead resources, maximize volunteer efforts, assist the state with achieving their fisheries goals, and help develop project designs	Supports—Should improve habitat conditions and fish abundance in the Upper Columbia Basin
Upper Columbia Salmon Recovery Board	Chelan, Douglas, and Okanogan Counties and Colville Tribes and Yakama Nation	Upper Columbia Basin	Create an ESU-level recovery plan for ESA-listed species in the Upper Columbia Basin	Supports—Reduces threats to the abundance, productivity, spatial structure, and diversity of listed species in the Upper Columbia Basin
Salmon Recovery Planning Act (Lead Entity- 2496)	Chelan, Douglas, and Okanogan Counties, and Foster Creek Conservation District, and Colville Tribes	Upper Columbia Basin	Provides a framework for identifying limiting factors, developing, and funding restoration projects.	Supports—Should improve habitat conditions for ESA-listed species in the Upper Columbia River
Habitat Conservation Plans	Chelan and Douglas County Public Utility Districts	Upper Columbia Basin (upstream from Rock Island Dam)	Achieve “no net impact” on anadromous salmonids	Supports—Should improve survival for migrating salmonids and improve watershed conditions

Wolf Creek HCP	Wolf Creek Reclamation District	Wolf Creek drainage	Minimize impacts to spring Chinook, steelhead, and bull trout	Supports—Should improve habitat conditions for ESA-listed species.
Colville Hatchery Program	Colville Confederated Tribes	Upper Basin	Mitigate for fish migration blockage created by Chief Joseph Dam.	Benign/Threaten— Depending on where rainbow and brook trout are planted, they may affect the survival and viability of chinook and steelhead (and bull trout).
Omak Creek Acclimation Pond	Colville Confederated Tribes	Okanogan Subbasin	Used to acclimate summer steelhead smolts from local broodstock	Supports—Should increase numbers of summer steelhead in the Okanogan Subbasin.
Wells Hydroelectric Project Wildlife Mitigation Program	Douglas County PUD	Upper Basin	Secure, protect, and restore wildlife habitat.	Supports—Protects and restores riparian habitat.
Federal Columbia River Power System Program	NOAA Fisheries	Upper Columbia Basin	Provide biological, hydrological, and engineering expertise for review and approval of dam and reservoir operations.	Supports—Intended to improve passage success and survival of fish passing through hydro projects.
Cumulative Risk Initiative	NOAA Fisheries	Upper Columbia Basin	Provide scientifically rigorous support for salmonid conservation and recovery planning.	Supports—Intended to improve life-stage survival of fish through examination of all-Hs
Ecotoxicology and Environmental Fish Health Program and Environmental Assessment Program	NOAA Fisheries	Upper Columbia Basin	Assess the effects of human activities on the health of wild fish.	Supports—Improves understanding of contaminants of fish.

Fish Passage Program	NOAA Fisheries	Upper Columbia Basin	Assess the effects and influences of the Columbia River hydropower system on the long-term viability of fish stocks.	Supports—Improves understanding of dam operations on survival of fish stocks.
Genetics and Evolution Program	NOAA Fisheries	Upper Columbia Basin	Evaluate how genetic processes contribute to species viability and develops genetic tools for resource management	Supports—Improves understanding of genetics and effects of actions on genetics of different fish stocks.
Salmon Harvest Program	NOAA Fisheries	Upper Columbia Basin	Provide technical expertise and develop tools for management of fish harvest	Supports—Improves understanding of harvest management.
Full Utilization Program	NOAA Fisheries	Upper Columbia Basin	Develop methods to improve fish processing.	Supports—Reduces waste released into aquatic habitats.
Integrative Fish Biology Program	NOAA Fisheries	Upper Columbia Basin	Research fish development, growth, reproduction, smolt quality, fish health, and disease	Supports—Improves understanding of the biology of fish stocks.
Mathematical Biology and Systems Monitoring Program	NOAA Fisheries	Upper Columbia Basin	Research methods to effectively monitor populations that are part of large scale environments.	Supports—Improves understanding of the status and trends of populations.
Migration Behavior Program	NOAA Fisheries	Upper Columbia Basin	Assess the effects and influences of the Columbia River hydropower system on the long-term viability of fish stocks.	Supports—Improves understanding of migration behavior of fish passing dams.
Northwest Salmon Recovery Planning Program	NOAA Fisheries	Upper Columbia Basin	Implement and plan salmon and steelhead recovery	Supports—Increases the long-term viability of listed fish stocks
Population Biology Program	NOAA Fisheries	Upper Columbia Basin	Develop the foundation for conservation and recovery efforts of listed stocks.	Supports—Implements conservation and recovery efforts for listed stocks.
Riverine Survival Program	NOAA Fisheries	Upper Columbia Basin	Assess the effects and influences of the Columbia River hydropower system on the long-term viability of fish stocks.	Supports—Increases understanding of hydropower effects on survival of fish stocks.
Salmon Enhancement Program	NOAA Fisheries	Upper Columbia Basin	Develop hatchery and cultural programs to rebuild endangered or depleted fish stocks.	Supports—Increases population abundance through the use of appropriate hatchery and cultural techniques.

Watershed Program	NOAA Fisheries	Upper Columbia Basin	Conduct research on physical and biological processes that affect aquatic ecosystems.	Supports—Increases understanding of watershed processes.
Conservation Securities Program	Natural Resource Conservation Service	Upper Columbia Basin	Reward landowners who demonstrate good land stewardship	Supports—Should improve riparian condition and stream flows.
Conservation Technical Assistance Program	Natural Resource Conservation Service	Upper Columbia Basin	Provide conservation technical assistance to landowners and agencies on planning and natural resource conservation.	Supports—Should improve riparian condition and stream flows through conservation of resources.
Emergency Watershed Protection Program	Natural Resource Conservation Service	Upper Columbia Basin	Undertake emergency measures to protect life and property from floods, drought, and products of erosion.	Benign/Threaten—Could decrease riparian conditions and result in loss of channel complexity.
Environmental Quality Incentive Program	Natural Resource Conservation Service	Upper Columbia Basin	Provide conservation programs for farmers and ranchers.	Supports—Should improve environmental quality on farms and ranches thereby reducing negative effects to streams.
Farm and Rangeland Protection Program	Natural Resource Conservation Service	Upper Columbia Basin	Protect farm and rangeland and create an easement	Supports—Should protect riparian corridors from development
Forestry Incentives Program	Natural Resource Conservation Service	Upper Columbia Basin	Support good forest management practices on private lands	Supports—Should protect riparian habitats from timber harvest
Grassland Reserve Program	Natural Resource Conservation Service	Upper Columbia Basin	Protect range and pasture lands from development (subdivision)	Supports—Should protect riparian habitats from development
Grazing Lands Conservation Initiative	Natural Resource Conservation Service	Upper Columbia Basin	Maintain and improve management, productivity, and health of privately-owned grazing lands	Supports—Should reduce soil erosion and recruitment of fine sediments to streams.
Resource Conservation and Development Program	Natural Resource Conservation Service	Upper Columbia Basin	Accelerate resource conservation and development	Supports—Should enhance the environment, including stream and riparian habitat.
Soil Survey Program	Natural Resource Conservation Service	Upper Columbia Basin	Provide soil survey information necessary for understanding, managing, conserving, and sustaining soil resources	Supports—Should reduce soil erosion and recruitment of fine sediments to streams.

Soil and Water Conservation Assistance Program	Natural Resource Conservation Service	Upper Columbia Basin	Provide cost share and incentive payments to farmers and ranchers to address threats to soil, water, and natural resources	Supports—Should reduce agricultural impacts to stream and riparian habitats
Snow Survey and Water Supply Forecasting Program	Natural Resource Conservation Service	Upper Columbia Basin	Provide information on future water supply.	Supports—Should provide information needed to maintain suitable stream flows
Stewardship Incentive Program	Natural Resource Conservation Service	Upper Columbia Basin	Provide technical and financial assistance to private forest landowners to keep lands and natural resources productive and healthy	Supports—Should improve riparian conditions on private lands.
Watershed Protection, Watershed Surveys, and Flood Prevention Program	Natural Resource Conservation Service	Upper Columbia Basin	Assist agencies and participants to protect and restore watersheds from erosion, floodwater, and sediments.	Benign/Threatens—Could decrease riparian conditions and result in loss of channel complexity.
Wetlands Reserve Program	Natural Resource Conservation Service	Upper Columbia Basin	Offers landowners opportunities to protect, restore, and enhance wetlands on their properties.	Supports—Should improve water quantity and quality
Wildlife Habitat Incentives Program	Natural Resource Conservation Service	Upper Columbia Basin	Provide incentives to develop and improve wildlife habitat on private lands.	Supports—Should improve riparian habitat
Conservation Loan Program	Okanogan County	Okanogan and Methow Subbasins	Promote the use of energy-efficient products and services.	Benign—Energy conservation measures for buildings should have no effect on fish and their habitats
Appliance Rebate Program	Okanogan County	Okanogan and Methow Subbasins	Provide rebates for customers that purchase energy efficient appliances	Benign—Rebates should have no effect on fish and their habitats
Abandoned Mine Land Program	Bureau of Land Management	Upper Columbia Basin	Identify and clean-up abandoned mines	Supports—Should reduce historic mining effects on fish and their habitats
Environmental Education Information	Bureau of Land Management	Upper Columbia Basin	Educate the public on environmental issues	Supports—Should improve and protect aquatic habitats through public understanding of healthy and productive ecosystems.
Federal Recreation Pass Program	Bureau of Land Management	Upper Columbia Basin	Require recreation fees in some parks, forests, wildlife refuges, and recreation areas.	Benign—Requiring fees should not harm fish and their habitats.

Interior Columbia Basin Ecosystem Management Project	Bureau of Land Management and U.S. Forest Service	Upper Columbia Basin	Develop a scientifically sound and ecosystem-based strategy for management of forests.	Supports—Should lead to protected and improved habitat conditions for fish.
Integrated Weed Management Program	Bureau of Land Management	Upper Columbia Basin	Inventory and complete ecological assessments for noxious weeds.	Benign—Inventory and EA for weeds should not negatively affect fish and their habitats.
Land Exchange Program	Bureau of Land Management	Upper Columbia Basin	Provide for acquisition, use, disposal, and adjustment of land resources.	Supports—Should place lands supporting important fish species in public ownership.
Leave No Trace Program	Bureau of Land Management	Upper Columbia Basin	Promote responsible use of public lands to recreationists participating in human-powered activities	Supports—Should lead to activities that protect riparian habitat
Watchable Wildlife Initiative	Bureau of Land Management	Upper Columbia Basin	Provide wildlife viewing opportunities	Benign—Providing wildlife viewing opportunities should not effect fish and their habitat
Chief Joseph Dam Project	U.S. Bureau of Reclamation	Upper Columbia Basin	Provide present and future irrigation development	Benign/Threaten—Has the potential to reduce stream flows below minimum flows needed for rearing and spawning.
Okanogan Project	U.S. Bureau of Reclamation	Okanogan Subbasin	Provide present and future irrigation development	Benign/Threaten—Has the potential to reduce stream flows below minimum flows needed for rearing and spawning.
Federal Columbia River Power System Program BiOp Habitat Mitigation Program	U.S. Bureau of Reclamation	Upper Columbia Basin	Improve stream flows, channel complexity, fish passage at diversion dams, and screen diversion intakes	Supports—Should improve stream flows, habitat conditions, fish passage, and prevent loss of fish in diversions.
Research, Monitoring, and Evaluation Program	U.S. Bureau of Reclamation	Upper Columbia Basin	Develop and implement a monitoring program to assess status, trend, and effectiveness of management actions.	Supports—Provides information on the status and trend of populations and their habitats, and assesses effects of management actions.
Farm Service Agency Conservation Reserve Program	U.S. Department of Agriculture	Upper Columbia Basin	Help agricultural producers to protect environmentally sensitive lands.	Supports—Should prevent erosion and protect riparian areas.

Advanced Hydropower Turbine Systems Program	U.S. Department of Energy	Upper Columbia Basin	Develop technology to maximize the use of hydropower resources while minimizing adverse environmental effects	Supports—Should improve survival of fish passing through turbines
Environmental Monitoring and Assessment Program	U.S. Environmental Protection Agency	Upper Columbia Basin	Assess the condition of ecological resources	Supports—Increases understanding of status and trends of populations and aquatic habitats.
Total Maximum Daily Load Program	U.S. Environmental Protection Agency	Upper Columbia Basin	Specify the maximum amount of a pollutant that a water body can receive and still meet water quality standards.	Supports—Improves and maintains water quality
Fish and Wildlife Assistance Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Restore and maintain the health of fish and wildlife resources	Supports—Should improve habitat conditions and population health
Partners for Fish and Wildlife Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Assist private landowners restore wetlands and other important fish and wildlife habitats	Supports—Should improve habitat conditions and population health
Fishery Resource Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Provide policy guidance, budget, planning, oversight, and coordination of diverse activities.	Supports—Should help improve habitat conditions
Entiat National Fish Hatchery Program	U.S. Fish and Wildlife Service	Entiat Subbasin	Produce and release spring chinook and coho salmon into the Entiat River	Threaten—Depending on the stock of chinook released, the program can threaten the viability of wild spring chinook (see Factors for Decline)
Winthrop National Fish Hatchery Program	U.S. Fish and Wildlife Service	Methow Subbasin	Produce and release spring chinook, summer steelhead, and coho salmon into the Methow River	Supports/Threatens—Supports abundance but may threaten diversity.
Hatchery Assessment Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Conduct production planning, marking, monitoring, and post-stocking evaluations for National Fish Hatcheries	Supports—Increases understanding of status and trends of hatchery fish

Native American Tribal Assistance Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Work with tribes to conserve and manage fish and wildlife resources on Tribal lands and ceded territories	Supports—Should protect and improve aquatic habitat conditions on Tribal lands
Habitat and Population Evaluation Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Conduct surveys to describe fish populations and other aquatic organisms and their habitats	Supports—Increases understanding of fish populations and their habitats
Conservation Assessment Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Conduct analytical evaluations of stock assessments, extinction probabilities, and develop sound biological and technical recovery strategies	Supports—Should improve habitat conditions and population health
Water Management and Evaluation Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Coordinate and manage flow conditions in the Columbia Basin	Supports—Should improve habitat conditions by increasing stream flows
Fish and Wildlife Mitigation Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Advocate fish and wildlife habitat needs within the basin	Supports—Should protect and restore aquatic habitat conditions
Information, Education, and Outreach Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Promote public stewardship of fish and wildlife resources and foster support for conservation through outreach strategies.	Supports—Should protect and restore aquatic habitat conditions and lead to wise use of resources
Partners in Flight Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Manage and conserve neotropical birds	Benign—Managing neotropical birds should have no effect on fish and their habitats
Conservation Planning Program	U.S. Fish and Wildlife Service	Upper Columbia Basin	Work with private landowners, local and state governments, corporations and others to conserve and protect listed and unlisted species on non-Federal lands	Supports—Should protect and improve aquatic habitat conditions on non-Federal lands
PACFISH/INFISH Program	U.S. Forest Service	Upper Columbia Basin	Develop an ecosystem-based aquatic habitat and riparian-area management strategy	Supports—Should protect and improve stream and riparian habitat conditions
Pacific Northwest Fisheries Program	U.S. Forest Service	Upper Columbia Basin	Develop programs to protect riparian reserves, protect key watersheds, and to restore watershed health.	Supports—Should protect and improve stream and riparian habitat conditions
Respect the River Program	U.S. Forest Service	Upper Columbia Basin	Restore and preserve riparian and flood prone areas and balance those needs with public needs	Supports—Should protect and restore riparian areas

Northwest Forest Plan	U.S. Forest Service	Upper Columbia Basin	Restore and maintain the ecological health of watersheds within the range of the northern spotted owl	Supports—Should improve aquatic and riparian habitat
National Streamflow Information Program	U.S. Geological Survey	Upper Columbia Basin	Provide long-term, accurate, and unbiased streamflow information	Supports—Monitoring streamflows will increase understanding of flow regimes
Lake Chelan National Recreation Area Forest Fuel Reduction/Firewood Management Plan	U.S. National Park Service	Chelan Subbasin	Reduce forest fuel accumulation in selected timber stands in the Stehekin Valley	Benign—Reducing fuel accumulation in the Stehekin Valley should have no effect on chinook and steelhead and their habitat in the Upper Columbia region
Lake Chelan NRA Management Plan	U.S. National Park Service	Chelan Subbasin	Manage visitor use, natural and cultural resources, development, and operation of the Lake Chelan Natural Recreation Area	Benign—Management of the Lake Chelan NRA should have no effect on chinook and steelhead and their habitat in the Upper Columbia region
Mountain Lake Fisheries Management Plan	U.S. National Park Service	Upper Columbia Basin	Develop and implement a conservation planning and environmental impact analysis process for mountain lake fisheries in the North Cascades National Park Service Complex	Benign—Conservation planning for mountain lake fisheries should have no effect on chinook and steelhead and their habitat in the Upper Columbia region
Columbia River Regional Initiative/Water Resource Program	Washington State Department of Ecology	Upper Columbia Basin	Develop an integrated state program for managing water resources--to allow access to new water withdrawals while providing support for salmon recovery	Benign/Supports—Should allow for water withdrawal without harming the survival of salmon and steelhead
Environmental Assessment Program	Washington State Department of Ecology	Upper Columbia Basin	Provide objective, reliable information about environmental conditions used to measure effectiveness of the program and to inform the public	Supports—Should increase understanding of status and trends of aquatic resources
Flood Control Assistance Program	Washington State Department of Ecology	Upper Columbia Basin	Work in partnership with communities to support healthy watersheds and promote environmental interests	Supports—Should preserve and improve aquatic habitat conditions

Water Quality Program	Washington State Department of Ecology	Upper Columbia Basin	Protect, preserve, and restore water quality	Supports—Should improve habitat conditions by protecting and restoring water quality
Water Resource Program	Washington State Department of Ecology	Upper Columbia Basin	Manage watersheds, administer water rights, and restore and maintain stream flows.	Supports—Should improve aquatic and riparian habitat
Columbia River Instream Resource Protection Program	Washington State Department of Ecology	Upper Columbia Basin	Insure the future viability of instream resource values of the mainstem Columbia River, including fish, wildlife, aesthetics, navigation, and hydropower resource values	Supports—Should improve the habitat characteristics of the mainstem Columbia River
Trust Water Rights Program	Washington State Department of Ecology	Upper Columbia Basin	Develop and test means to facilitate the voluntary transfer of water and water rights, including conserved water, to provide water for presently unmet and emerging needs	Supports—If water is transferred back to streams with flows less than minimum levels for salmon and steelhead.
Water Acquisition Program	Washington State Department of Ecology	Upper Columbia Basin	Increase stream flows in watersheds with vulnerable salmon and trout populations	Supports—Increases stream flows in important watersheds
Aquatic Education Program	Washington State Department of Fish and Wildlife	Upper Columbia Basin	Educate the public on environmental and salmon issues	Supports—Should help improve and protect fish and their habitats
Aquatic Habitat Guidelines Program	Washington State Department of Fish and Wildlife	Upper Columbia Basin	Develop technical assistance guidance for those who want to protect and restore salmonid habitat	Supports—Should protect and restore aquatic and riparian habitats
WDFW Hatcheries Program	Washington State Department of Fish and Wildlife	Upper Columbia Basin	Mitigate for chinook, steelhead, and sockeye salmon lost by the operations of Upper Columbia dams	Supports/Threatens—Supports abundance but may threaten diversity. Based on current operations and use of brood stock, this program should increase the production of chinook and steelhead in the Upper Columbia region (See Reasons for Decline)
Hydraulic Approval Program	Washington State Department of Fish and Wildlife	Upper Columbia Basin	Regulate activities that affect the bed or flow of waters for the protection of fish life	Supports—Should protect aquatic habitat conditions

Agriculture, Fish and Water Program	Washington State Conservation Commission	Upper Columbia Basin	Negotiate changes to the existing Technical Guide and develop guidelines to be used to enhance, restore, and protect habitat for endangered fish and wildlife species	Supports—Should protect and restore aquatic and riparian habitats
Conservation Reserve Enhancement Program	Washington State Conservation Commission	Upper Columbia Basin	Provide incentives to restore and improve salmon and steelhead habitat on private lands	Supports—Should improve aquatic and riparian habitat on private lands
Salmon Habitat Limiting Factors	Washington State Conservation Commission	Upper Columbia Basin	Assess the habitat-based factors limiting the success of salmonids	Supports—Should increase understanding of limiting factors
Wetland and Fish and Wildlife Activities	Washington State Department of Transportation	Upper Columbia Basin	Maintain or implement activities that limit or reduce impacts to fish and wildlife and their habitats	Supports—Activities should improve connectivity and reduce sediment delivery to channels
State Parks Program	Washington State Parks and Recreation Commission	Upper Columbia Basin	Acquire, operate, manage, enhance, and protect a diverse system of recreational, cultural, historical, and natural sites	Supports—Should protect and enhance aquatic and riparian habitats
Coho Salmon Reintroduction Program	Yakama Indian Nation	Upper Columbia Basin	Assess the feasibility of re-establishing coho salmon in tributaries to the Upper Columbia River	Benign/Threatens—The reintroduction of coho should have little to no effect on production of chinook and steelhead (see Factors for Decline)

Incentive Programs

Develop a preferential tax incentive through the Public Benefit Rating System administered by the County under the Open Space Taxation Act (RCW 84.34) which would encourage private land owners to preserve and restore shoreline areas for “open space” tax relief. The Department of Ecology has a guidance document for local governments to use any portion of the criteria to tailor their public benefit rating system to the watershed issues they are facing. Another option is to incorporate restoration in accordance with the performance based cluster platting Okanogan County Code 16.14. This would encourage development to be clustered outside of critical habitat areas to protect them. This program also promotes restoration opportunities, recreation opportunities, and public access opportunities.

Implementation and Monitoring

In addition to project monitoring required for individual restoration and/or mitigation projects, the cities and the county should conduct system-wide monitoring of shoreline conditions and development activity, to the degree practical, recognizing that individual project monitoring does not provide an assessment of overall shoreline ecological health.

The following approach is suggested:

1. Track information using GIS and the permitting software as activities occur, such as:
 - a. New shoreline development, by permit type
 - b. Unresolved compliance issues
 - c. Mitigation areas
 - d. Restoration areas

The county or city may require project proponents to monitor as part of project mitigation, which may be incorporated into this process. Regardless, as development and restoration activities occur in the shoreline area, the municipalities should seek to monitor shoreline conditions to determine whether both project specific and SMP overall goals are being achieved.

2. Periodically review and provide input to the regional ongoing monitoring programs/agencies, such as:

- Washington Dept of Ecology water quality monitoring
- Methow Watershed Council
- Okanogan Basin Watershed Planning Unit
- Okanogan Conservation District
- Washington Department of Fish and Wildlife
- Upper Columbia Salmon Recovery Board

Through this coordination with regional agencies, the municipalities should seek to identify any major environmental changes that might occur.

3. Periodic review of environmental processes and functions at the time of SMP updates to, at a minimum, validate the effectiveness of the SMP. The review should consider what restoration activities actually occurred compared to stated goals, objectives and priorities, and whether restoration projects resulted in a net improvement of shoreline resources. Under the Shoreline Management Act, the SMP is required to result in no net loss of shoreline ecological functions. If this standard is found to not be met at the time of review, county or city will be required to take corrective actions. The goal for restoration is to achieve a net gain in ecological function. The cumulative effect of restoration over the time between reviews should be evaluated along with an assessment of impacts of development that is not fully mitigated to determine effectiveness at achieving a net improvement to shoreline ecological resources.

To conduct a valid reassessment of the shoreline conditions every seven years, it is necessary to monitor, record and maintain key environmental metrics to allow a comparison with baseline conditions.

As monitoring occurs, the county and cities should reassess environmental conditions and restoration objectives. Those ecological processes and functions that are found to be

worsening may need to become elevated in priority to prevent loss of critical resources.

Evaluation of shoreline conditions, permit activity, GIS data, and policy and regulatory effectiveness should occur at varying levels of detail consistent with the Regional Shoreline Master Program update cycle and the Comprehensive Plan amendment cycle which takes place every five years. A complete reassessment of conditions, policies and regulations should be considered every seven years.