

## 9. Long-Term Planning Issues

### Commitments and Conditions

The Stillaguamish Watershed Chinook Salmon Recovery Plan is a voluntary plan. All participating jurisdictions and stakeholders have the option to adopt the whole Plan, endorse specific recommendations, or not support the Plan. At this time, all of the jurisdictions and stakeholder organizations participating in the SIRC are working together to restore salmon. The SIRC will ask for letters or resolutions from participating jurisdictions and stakeholder organizations to describe their level of commitment to the Plan's recommendations and to Chinook salmon recovery in the Stillaguamish Watershed.

Many different entities have authority over the factors that contribute to the decline of Stillaguamish Chinook salmon. The State of Washington and the Washington State Treaty Tribes are co-managers of salmon harvest and operate most salmon hatcheries. A host of other agencies, including the United State Forest Service (USFS), Washington Department of Natural Resources (WADNR), counties, cities, and private landowners have jurisdiction in areas that influence habitat conditions.

The policy and regulatory issues described above are complex and will require a significant amount of coordination with the appropriate local, state, and federal government agencies. The SIRC is committed to an aggressive approach to Chinook salmon recovery and will continue building relationships with individual agencies and other stakeholders as necessary to develop policy and regulatory commitments. There is concern among the SIRC that ongoing local land uses may continue to degrade salmon habitat and watershed processes while voluntary restoration actions are making progress to recover Chinook salmon populations. As a result, the SIRC will look for state and regional leadership on regulatory matters, including:

- Implementation of local land use policies and zoning regulations that protect critical areas and other watershed functions that support sensitive fish habitat
- Enforcement of forest management regulations and improved forest management practices on private, state, and federal lands
- Review and modification of the U.S. Army Corps of Engineers riparian maintenance policy



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- Streamlined permitting from state and federal agencies for implementation of voluntary restoration actions
- Poaching enforcement and penalties in the Stillaguamish Watershed, Puget Sound, and in the Pacific Ocean

## Economic Analysis

A generalized economic impact analysis of the Stillaguamish Watershed Chinook Salmon Recovery Plan has not been conducted. A general economic impact analysis for salmon recovery would be most reliable when done on a larger-than-watershed scale (for example, a Puget Sound-wide analysis). Economic data is more available and accurate at the regional level, in addition to the fact that secondary economic impacts are not usually captured at the local (i.e. Stillaguamish) level. For a Stillaguamish-specific economic analysis to be accurate, these secondary effects would have to be measured.

Significantly larger Chinook salmon populations could potentially bring positive economic benefit to Snohomish County and the surrounding region. However, the projected increase in Chinook salmon populations is not significant in the initial 10-year timeframe of this Plan. Whether or not these additional fish would be available for harvest would be a matter of policy, not economics, at that time. Even assuming that policy did allow their harvest, the economic significance for commercial or sport fishing would be small, due to the small population size. Over a longer time horizon of 100 years, Chinook salmon populations might regain sufficient robustness to withstand significant harvest and create a significant economic benefit. However, economic projections over such a long time period are not reliable.

The attractive natural environment is a factor which draws many people to live in the Pacific Northwest region. According to state projections, the population of Snohomish County is expected to grow from its current level of 639,400 to 930,000 by the year 2025 (an increase of 45% in twenty years)<sup>37</sup>. While this population increase will bring new businesses and jobs to the region, it will also have an associated infrastructure cost to support these new inhabitants, as well as an environmental impact cost which could actually have a negative impact on Chinook salmon population recovery.

Some localized economic analyses of land protection measures associated with salmon recovery programs have been completed in the region, which detail micro- and macro-economic impacts to farming communities and enterprises<sup>38</sup>. A regional economic analysis of Skagit County's proposed riparian protection program in 2003 showed reduced agricultural production

<sup>37</sup> Snohomish County Planning and Development Services.  
<http://www1.co.snohomish.wa.us/Departments/PDS/>

<sup>38</sup> It should be noted that these were not comprehensive studies of all salmon recovery efforts.

as a result of the program, accompanied by a decline in farm proprietor and labor income, as well as a decrease in farm-related jobs. No significant benefit to the salmon fishing industry resulted from the program (Skagit County 2003). An economic analysis of farm buffers in the Stillaguamish Watershed showed that while buffers can have a negative impact on the farm enterprise, this is not always the case. The net impact depended highly on the type of farm, its size, and the availability of buffer cost share programs (Resource Consulting 2004).

## Funding

The Shared Strategy has created a task force to develop a preliminary salmon recovery financing strategy. This committee will assess current and potential sources of salmon funds, and identify different scenarios for funding recovery actions. They will solicit input and feedback from watershed planners and stakeholders, and present their recommendations for regional funding strategies to the Shared Strategy's Development Committee.

The task force has identified a set of key assumptions about salmon recovery funding:

- The financing strategy will result in increased funding of salmon recovery in the Puget Sound region, will be developed in consultation with other regions, and will use funding strategies that benefit the entire state whenever possible.
- The financing strategy will result in greater dependability in the level of funding and sources available for salmon recovery needs for the first ten years of implementing the recovery plan.
- The financing strategy will result in greater efficiency in the awarding of capital funding, with less money spent on competition for funding and more on on-the-ground results.
- The financing strategy will depend primarily on more effective use of existing funding sources and compliance with state, federal, and local regulatory programs.
- The financing strategy will address capital and key operating costs for habitat, hatcheries, and harvest management.
- The financing strategy will reward leadership, commitment, and results.
- The financing strategy will support a tangible set of achievements at the local, regional, and/or statewide scale in the first ten years of plan implementation.

The regional financing strategy will identify sources of salmon funding, the conditions for accessing those funds, and the dependability of those funding sources. The task force will work to identify funding gaps and strategies to

raise the necessary funds to fill those gaps. Initial cost estimates identified for salmon recovery in the Stillaguamish Watershed will be combined with estimates from the other Puget Sound watersheds to identify the total estimated costs related to recovery actions for the first ten years of plan implementation. The task force will identify mechanisms for matching funding needs with adequate funding sources, as well as identifying potential new funding sources. Lastly, the financing strategy will evaluate the commitments necessary to implement the regional financing strategy, and ways to develop those commitments.

## Research and Data Gaps

A significant amount of research has been completed in the Stillaguamish Watershed. A list of key past research accomplishments is included in Appendix B. This research includes studies on riparian and habitat conditions in the watershed; the effects of land use on salmonid habitat and water quality; limiting factors for salmon habitat; technical assessment and recommendations for Chinook salmon recovery; and several subbasin assessments. This information is being applied through modeling and on-the-ground actions.

Current gaps in available information may limit the effectiveness of a comprehensive Chinook salmon recovery strategy. A comprehensive limiting factors analysis has been completed for the Stillaguamish Watershed outlining a prioritized list of data and information gaps. Below is a sample of data gaps and corresponding research that could fill these gaps as funding allows.

### Population Estimation

- South Fork Chinook salmon spawner surveys

### Estuary/Nearshore

- Analyze juvenile Chinook salmon use of estuarine and lower river habitat (type of habitat used and timing) – *in progress*
- Undertake a baseline study of nearshore habitat conditions and usage by juvenile Chinook salmon – *in progress*
- Evaluate effectiveness of salt marsh habitat restoration
- Encourage co-managers and federal agencies to evaluate extent of predation on Stillaguamish Chinook salmon populations

### Large Woody Debris

- Survey LWD in Chinook salmon production reaches which have not yet been surveyed (lower Armstrong Creek, Pilchuck Creek, Jim Creek, Deer Creek). Starting in 2005, re-survey those reaches surveyed since 2000.
- Co-monitor pools and juvenile usage of wood structures.

#### Floodplain

- Identify high quality habitat and willing landowners for future restoration activities.

#### Sediment

- Monitor and develop a sediment budget focused on fine sediment which impacts Chinook salmon redds.

#### Hydrology

- Establish the effect of instream flows and water rights withdrawals on summer low flow conditions.
- Model effect of wetland degradation and forest cutting on base-, mean, and peak-flows and stages.
- Assess proportion of hydrologic change due to natural vs. anthropogenic causes

#### Water Quality

- Evaluate temperature impacts in the lower river on Chinook salmon survival and fecundity

#### Noxious Weeds

- Evaluate the effects of *Spartina spp.* on salt marsh habitat functions for juvenile Chinook salmon
- Evaluate the effects of knotweed on riparian habitat functions for Chinook salmon

As this information becomes available, it should be incorporated into the management activities of those agencies regulating habitat and land use in the watershed.

## Policy and Regulatory Issues

In addition to individual project actions to protect and restore Chinook salmon habitat, a number of policy and regulatory issues exist that will need to be addressed in order to pursue a comprehensive Chinook salmon recovery strategy. In the past, the SIRC has chosen primarily to focus on compliance and enforcement of existing regulations related to salmon habitat and watershed processes. However, in order to achieve an effective overall Chinook salmon recovery strategy, the SIRC will identify areas for regulatory coordination and may identify specific policy and regulatory gaps. Policies and regulations would be analyzed in the context of how they help or hinder watershed processes and Chinook salmon conservation.

## Land Use Regulations

Chinook salmon habitat restoration will not be effective if environmental degradation continues due to population growth and urban/suburban development. Land use policies and regulations that affect fish habitat and watershed processes include those related to growth management; protection of critical areas, including streams, wetlands, and geological hazard areas (steep slopes, landslide-prone areas); development in the floodplain; and protection of channel migration zones. The SIRC should conduct an evaluation of how effective all existing local land use regulatory programs are on protecting salmon habitat and make recommendations to the relevant jurisdictions to improve those policies and regulations found to be deficient for protecting salmon habitat and watershed functions.

Adequate refinement and enforcement of existing local land use regulations must reflect growth management policies designed to protect habitat. Growth management allows cities such as Arlington and Stanwood to expand within their urban growth areas, as well as expand their urban growth boundaries. Population increases are expected in the Arlington and Stanwood Urban Growth Areas, as well as a small commercial expansion in the vicinity of Darrington to increase employment opportunities in that community. Despite the intent of GMA, new commercial development and conversion of agricultural lands to rural residential land use can continue to impact sensitive habitat areas and conflict with watershed-based planning and restoration efforts. The conversion of existing forest and agricultural lands to rural residential and urban uses is a significant future concern.

Uncertainty related to local development regulations will present a challenge to salmon recovery efforts. As required by the Washington state Growth Management Act, counties and cities are required to update their Critical Areas Ordinances by December 2005 and update their Shoreline Management Master Programs by 2012. These updates provide an opportunity to coordinate local government policies and regulations with salmon recovery objectives. The protections offered by these regulations include stream and wetland buffers that are essential to preserving Chinook salmon habitat. The SIRC is monitoring development of the Snohomish County 10-Year GMA Comprehensive Plan Update, Critical Areas Regulations and Shoreline Master Plan updates, and will review and provide input during the appropriate comment periods. The SIRC has encouraged Snohomish County Planning and Development Services to consider the contents of the Stillaguamish Watershed Chinook Salmon Recovery Plan in drafting these new County policies and regulations.

Other regulatory and non-regulatory tools, including wetland preservation, sensitive area acquisition, site design, development guidelines, assessment, and monitoring should be utilized to support natural habitats and manage growth impacts. A landscape-level watershed planning approach will be

important in order to minimize and mitigate the effects of increasing urbanization throughout the watershed. Local government comprehensive plans and development regulations should consider these additional tools:

- Designate zoning classifications that meet natural landscape attributes and limit impervious surfaces by sub-basin
- Encourage natural floodplain processes and prohibit incompatible floodplain land uses such as bank hardening

## Nearshore/Marine Environment

The goal of the nearshore component of a Chinook salmon recovery plan is to develop actions and planning area commitments to protect and restore those places of significance to salmon in the nearshore and marine areas of Puget Sound. The nearshore-marine system still has functioning habitats and processes that are critical to protect and restore. An integrated approach to harvest, hatchery, and habitat management in the nearshore-marine environments will be essential to addressing cumulative effects on salmonid populations.

The complexity of the use of the nearshore-marine environment by all Puget Sound Chinook salmon populations, combined with lack of sufficient information on these populations, limit the present ability to make quantitative nearshore-specific predictions relative to the VSP parameters in the timeframe of the Shared Strategy process. The Puget Sound Technical Recovery Team (TRT) will define the biological basis for nearshore-marine recovery related to Puget Sound Chinook salmon populations, and the USFWS Puget Sound/Olympic Peninsula Recovery Unit Team (RUT) will define the biological basis for nearshore-marine recovery related to bull trout populations. A separate regional nearshore-marine chapter of a recovery plan will be developed by the Puget Sound Action Team for the Shared Strategy to incorporate initiatives like the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP), as well as technical and implementation issues best addressed at the regional scale.

Given the growth pressures in the region and developing understanding of the nearshore habitats and processes, the focus of short-term efforts will be to protect existing processes and habitats, and to ensure future opportunities for restoration and protection. Quantitative habitat expectations will be set for nearshore-marine contributions at the regional scale as the watershed-level information is compiled across Puget Sound. The Shared Strategy salmon recovery plan will incorporate more technically robust long-term strategies under development by NOAA Fisheries, PSNERP, and The Nature Conservancy as understanding of what actions are required and how those actions directly benefit fish populations improves.

## Viability of Fisheries, Agriculture, and Forestry

Fishing, farming, and forestry are economically and socially important in the Stillaguamish Watershed. The ongoing viability of these natural resource industries is vital to Chinook salmon recovery as well as to the regional economy. The SIRC has strong support from the natural resource sector as a result of ongoing recognition of the benefits and value of local agriculture, forestry, and fisheries in the Stillaguamish Watershed.

Many key stream and river habitats in the Stillaguamish Watershed are on or near agricultural and forest lands. The potential impacts from agriculture and forestry to Chinook salmon habitat can be reduced by stewardship activities initiated by willing landowners. Recognizing that protection, restoration, and management of riparian areas and wetlands within the floodplain are important to salmon recovery, incentives must be in place to allow farmers and foresters to participate in Chinook salmon habitat restoration and protection. Without these incentives, farm and forest owners may consider selling and converting their lands to residential and commercial uses. The permanence of change resulting from this type of land use conversion has significant long-term impacts that conflict with the goals of salmon recovery and ecosystem restoration. The SIRC will continue to develop collaborative and coordinated approaches to watershed protection and restoration that include the interests of local farmers and foresters throughout the watershed.

The fishing economy is critical to the Tribal and non-Tribal community of the Stillaguamish Watershed. Tribal and non-Tribal fisheries have been severely impacted by reductions in fish populations. Voluntary reductions in harvest activities have reduced the impact from direct take of Chinook salmon. The SIRC feels the resource industries in the Stillaguamish Watershed need to continue to be viable and are essential to meaningful salmon recovery efforts.

## Floodplains

While floodplains provide both important habitat features and components of hydrologic function critical for salmon, they are also the location of some economically and socially valuable land uses in the watershed. The ability for upstream floodplain storage to reduce flood impacts downstream is important to the Stillaguamish community and the SIRC. Therefore, restoring floodplain connectivity is also viewed by the SIRC as an opportunity to reduce the impact of floods downstream on human infrastructure. To secure future enhancement of floodplain function, the SIRC will support efforts to maintain agricultural uses of the floodplain, as well as implementation of restoration projects and agricultural Best Management Practices wherever applicable to reduce the negative impacts of agriculture in the floodplain.

The Stillaguamish River Comprehensive Flood Hazard Management Plan (Flood Plan) considers the impacts of flooding on aquatic habitats. One of the

plan's goals states "To the maximum extent possible, allow and encourage natural floodplain processes." Approximately 9,530 acres of mainstem floodplain is used for agriculture due to the rich soils provided by floodplain processes. The Flood Plan also states "Encouraging retention of low-density uses on large parcels (such as farmland) is key to preventing future flood damages from occurring." The zoning of this area is designated as "Ag-10", allowing for the potential construction of up to 800 new homes in the floodplain. Approximately 1,540 additional acres are zoned as "Rural Residential", with the potential for up to 130 new homes to be constructed in other parts of the floodplain. The total number of new homes that could potentially be built in the floodplain is almost twice the number of existing homes in the floodplain.

The hypothesis is that the largest threat to restoring floodplain connectivity in the Stillaguamish is the conversion of existing agricultural lands to rural residential uses. Due to poor economic conditions associated with farming, the current land use trend is splitting of large agricultural lands by retiring farmers into the smallest parcels allowed by county zoning. These parcels would then be developed for rural residential uses. While agricultural uses and some seasonal combined uses are compatible with floodplain function, rural residential uses and the resulting roads and infrastructure may be incompatible with both floodplain function and existing agricultural uses.

The role of sediments in relationship to floodplain function is widely misunderstood. Residents of the floodplain regularly refer to historic dredging of the river and comment on recent build-up of sediments causing increases in flood damage. Contrary to local opinion and surprisingly to some local residents, the stream bottom in some sections of the lower river is actually lower (degraded) than it was historically. The relationship between sediments and flooding is described in Section 3.4.2 of the Flood Plan. This section describes the movement of sediments through the river system and identifies locations where the river channel is aggrading and degrading. The plan includes a description of the various flood planning efforts that have occurred over the decades. The most beneficial of these planning efforts in relation to salmon recovery is the U.S. Army Corps of Engineers' Stillaguamish River Ecosystem Restoration Final Feasibility Report and Environmental Assessment (2000). This study identified locations in the floodplain and estuary that, if restored, would provide aquatic habitat and functions beneficial to downstream habitats, and, if implemented, also provide some flood relief.

The Flood Plan states that flood control activities from 1930 to the present have resulted in the loss of more than one-third of the mainstem channel area (Collins 1997). Section 6.2.2 states that gravel removal from the river bed may contribute to the disconnection of side-channel slough from the main channel, or disconnection of the floodplain from the main channel by

deepening the channel. Section 6.2.3 prioritizes alternatives encouraging natural floodplain processes, such as re-establishing natural storage area or conveyance channels.

Current floodplain projects in the watershed include complete removal of flood control structures to allow for restoration of natural processes (Smokes Farm), and other projects that take more of an engineered maintenance approach (North Meander) due to funding and modeling constraints. It has long been the position of the SIRC to restore natural floodplain functions whenever possible, but if necessary to gain the support of individual SIRC members, alternatives will be considered. The SIRC recognizes that the various floodplain restoration actions are attempting to correct impacts that have occurred over the past 125 years. The SIRC also recognizes that it may be decades before floodplain lands are available for dike setback or removal. In the short-term, specific floodplain projects may have a narrow focus for the benefit of salmon recovery, while social and economic conditions develop over the long-term for consideration of other potential alternatives.

The SIRC may explore opportunities to remove hardened banks and restore floodplain habitats in the lower mainstem Stillaguamish River and other reaches with significant bank armoring. The lower mainstem reach of the river historically had abundant side channels and higher incidence of channel migration, but is now heavily modified. Restoration of this and other floodplain reaches would require negotiation with riparian landowners.

Other alternatives that are in the discussion stages include the intentional flooding of farmland for wetland banking. The Transfer of Development Rights program is funded and being developed at Snohomish County with support of the council and executive. FEMA is aware that there is a need for better flood elevation information on the Stillaguamish. The SIRC members can also continue to work with individual landowners as we have done with the Smokes farm, North Meander and old Channel projects.

To provide for a greater level of certainty, the SIRC will organize a subcommittee to develop a comprehensive floodplain function strategy. This subcommittee will conduct an analysis of those regulatory agencies impacting floodplain function, including Snohomish County, the Cities of Arlington and Stanwood, and the Washington State Departments of Ecology and Natural Resources. Subcommittee representatives from those agencies will meet with other relevant stakeholders, including the Stillaguamish Flood Control District, Stillaguamish and Tulalip Tribes, agricultural representatives, land trust agencies, and other interested parties.

## Forest Lands

Current use of forest lands has three relevant considerations for salmon recovery planning. First, cumulative timber harvest activities in steep

headwaters have and continue to cause channel widening and significant sediment loads in tributaries of the North and South Fork Stillaguamish River. Second, improper forest road construction has been a significant contributor to cumulative sediment loads and impacts to hydrology. Third, the management of riparian zones in headwater streams is key to maintaining the integrity of the hydrologic regime and instream stability.

In the future, timber harvest, forest road building and forest practices on steep slopes and riparian areas need to be conducted with full consideration of habitat conditions. Because forestry is such an extensive land use in the Stillaguamish Watershed, it is important for local salmon recovery efforts to account for how the existing regulatory framework for the forestry sector contributes to the protection and restoration of salmon habitat. Recent changes to the Washington State forest practice rules are encouraging. However, these rules must be implemented and monitored if the changes are to be effective. The SIRC recognizes the longevity of timber production, coupled with market and regulatory uncertainty, adversely impacts the economic viability of forest land ownership and that conversion to urban development may result in more significant impacts over time. The permanence of change resulting from this type of land use conversion has significant long-term impacts that conflict with the goals of salmon recovery and ecosystem restoration. Incentives should be established to encourage and enable continued private forest land participation in the protection and restoration of salmon habitat.

The sustainability of timber harvest is tied to both the hydrological function as well as sustainable economics in the watershed. Excessive harvest in the short-term will not leave enough timber to harvest in the future. Protecting the watershed function and sustainable forestry can be mutually beneficial if the right balance between timber harvest and watershed function is achieved.

The SIRC should coordinate with the appropriate state and federal agencies to encourage the following policies that support Chinook salmon recovery in the Stillaguamish Watershed:

- Improved forest management protection of riparian habitat
- Forest road BMPs and some hydrologic restoration
- Increase in forest harvest rotation intervals leading to more mature forest
- Maintain forest cover of 80% at subbasin scale

Changes in forest practices would provide multiple benefits throughout the watershed. In addition to improving salmon habitat, retention and creation of mature forest would reduce flooding in the lower reaches of the watershed.

The Snohomish County General Policy Plan contains sections on forestry (GPP Goal LU-8). Forestry goals and policies in the County GPP do not include a goal or policy to conduct forest practices in a manner that are

consistent with the Stillaguamish Watershed Chinook Salmon Recovery Plan. Forestry policies that would be consistent with the direction of this Plan would include encouraging growth and retention of mature forests, limiting erosion from forest road construction, encouraging efforts to limit the impact of landslides on sedimentation, and making efforts to control peak water runoff from clear cut logging operations. The SIRC encourages revisions to the General Policy Plan to include forestry policies that are consistent with meeting habitat protection and salmon recovery objectives.

The SIRC recognizes that the Forest and Fish Agreement has changed the way forestry is conducted in Washington State and that it is contributing to the recovery of Chinook salmon in the Stillaguamish Watershed. However, the SIRC also recognizes that existing science also indicates a need for additional habitat improvements that go beyond the requirements of the Forest and Fish Agreement. Because of this, the SIRC encourages the exploration of incentives that would enable forest land owners to take the additional steps that are needed to restore salmon habitat and watershed processes.

## Instream Flows

State instream flow regulations seek to ensure perennial rivers and streams of the state have base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic, navigational, and other environmental values, while also providing water for future human needs. The Washington Department of Ecology is currently in the process of establishing an instream flow rule for the Stillaguamish, with input from watershed stakeholders. While providing sufficient reserves for future rural development, the proposed Stillaguamish water management rule will set instream flows needed in streams at specific locations and times to protect fish spawning and rearing, among other objectives.

The Department of Ecology anticipates setting instream flows at the following points in the Stillaguamish Watershed:

- Stillaguamish River at Silvana
- NF Stillaguamish River at Arlington
- NF Stillaguamish River at Whitman Road
- SF Stillaguamish River at Arlington
- SF Stillaguamish River at Granite Falls
- Pilchuck Creek
- Jim Creek
- Squire Creek
- Canyon Creek

It is recognized by all interests that there is a limited amount of water available during the low flow periods between July and October. It is unknown at this time to what extent diversions or water withdrawals cause or contribute to the low flow problems in the watershed. The proposed instream flows will protect against future diversions or junior water rights exacerbating low flow problems. The Department of Ecology, along with Snohomish County, the City of Arlington, and the Stillaguamish Tribe, is implementing a stream monitoring program in the watershed to collect basic data and to implement the future instream resource protection program.

During the spring of 2005 the Stillaguamish Tribe, Snohomish County, and Northwest Hydraulics initiated a Stillaguamish Instream Flow Assessment Pilot Project funded by the Shared Strategy for Puget Sound. The pilot study will use a geographically-focused approach to target discrete subbasins within the Stillaguamish Watershed where human actions are likely to be affecting flow regimes, both now and in the future. The pilot study looks to relate these human-induced flow changes to impact on salmonids by the use of Ecosystem Diagnosis and Treatment (EDT) and possibly SHIRAZ modeling, coupled with HSPF hydrologic modeling. The overall approach incorporates two contrasting, but very representative and transferable, case studies. Pilchuck Creek is a large Chinook salmon-bearing stream assumed to be affected primarily by water withdrawals, Church Creek is a smaller coho salmon-bearing stream affected primarily by current and future land use changes. The project will conclude by Fall 2005, with management recommendations to the watershed concerning human activities that potentially impact low flows. If successful, the pilot approach would be applied throughout the Puget Sound and beyond.

## Water Quality

The Stillaguamish community has worked hard for 15 years to clean up the watershed for all citizens. Initiatives to protect and restore water quality were the foundation of the SIRC. Efforts continue to develop cleanup plans for impaired waterbodies and to address failing septic systems. Some water quality issues, such as improvements in sediment and temperature, are closely linked to salmon recovery. It is an objective of the SIRC that parallel efforts continue on water quality initiatives while salmon recovery work progresses.

Compliance with federal and state water quality laws has significant implications for salmon recovery. Snohomish County and other jurisdictions within the Stillaguamish Watershed must ensure compliance with regulations such as the Clean Water Act. The goals of the Act are to achieve and maintain “swimmable and fishable” waters. Municipalities and other entities subject to National Pollutant Discharge Elimination System (NPDES) permits are required to set standards for pollution, establish stringent conditions for development activities, and enforce violations.

The SIRC and its member agencies and individuals are working with the Department of Ecology, which is the state agency with responsibility for maintaining and protecting surface and groundwater quality, in developing implementation plans for two Total Maximum Daily Load (TMDL) projects. These projects address current water quality problems in the Stillaguamish where the waters do not meet state water quality standards for dissolved oxygen, fecal coliform bacteria, pH and temperature. The implementation plans will include strategies and activities needed to make water quality improvements; identification of responsible agencies and funding needs; and a timetable to bring about water quality improvements by the year 2009.

The Stanwood wastewater treatment plant is currently close to meeting its obligations to upgrade, operate and test their system to meet the Department of Ecology's NPDES requirements. The upgraded wastewater treatment plant should reduce the potential release of excessive fecal coliform and dissolved oxygen demands. These water quality improvements will benefit juvenile salmonids that utilize the old Stillaguamish channel and estuary locations which may have formerly been impacted by effluent discharges from the treatment plant.

Snohomish County and cities that have not adopted Ecology's Stormwater Manual for Western Washington should develop a stormwater program that is equivalent to this manual in ensuring that development projects are designed with the goal of infiltrating most of their stormwater. Infiltration addresses both the negative quality (i.e., carrying fecal coliform bacteria) and quantity (i.e., increasing peak flows and scouring as impervious areas increase) aspects of stormwater in urbanizing areas. Local stormwater management regulations should include provisions to:

- Retrofit/re-design infrastructure to decrease sediment and flow effects
- Provide incentives for low impact development design techniques (e.g., reduced impervious surfaces and increased stormwater infiltration)

## Treaty Tribes and the Salmon Culture

The Stillaguamish and Tulalip Tribes have a deep cultural and economic stake in viable salmon populations. Rights to fish for salmon are protected by federal treaty and have been verified by subsequent court decisions. Because populations are so depressed, the Tribes have not had a directed Chinook salmon fishery in the watershed for over two decades. It cannot be overstated how critical the cultural survival of the Tribes is dependent on the survival of salmon. For centuries, the Tribes have followed and depended on the migration of the salmon for subsistence, ceremonial and, eventually, economic livelihood. The Boldt decision upheld the Tribes' right to harvest salmon in their usual and accustomed areas, and began the discussion of co-management with the State of Washington over habitat protection. The Tribes will

continue to be a key partner for salmon recovery and one with a special stake in its success.

## Closing

Meeting all of the goals identified in this Stillaguamish Watershed Chinook Salmon Recovery Plan will be the responsibility of the people living in the Stillaguamish Watershed over the next 100 years. In addition to those contained in this plan, the SIRC will continue to make recommendations for additional actions to benefit Chinook salmon, watershed residents, and the overall Stillaguamish River ecosystem.

