

Stillaguamish Watershed Salmon Recovery Three-year Implementation Work Plan 2007 – 2009

Prepared by the Stillaguamish Lead Entity
April 28, 2006

Purpose and Structure

This three-year work plan defines actions of the Stillaguamish Lead Entity and our partners to implement the Stillaguamish Watershed Chinook Salmon Recovery Plan.¹ It will serve as a work planning and financing tool for our partners, Shared Strategy, and the Puget Sound Salmon Recovery Council, but it is not a binding contract. It is intended to help us prioritize, sequence, and set the pace of implementation for capital and non-capital activities to achieve our ten-year objectives. We will update our three-year work plan annually.

This work plan includes a narrative summary of our salmon recovery plan and the capital and non-capital activities that are underway or should be implemented in the 2007 – 2009 timeframe. Both general and specific actions are included. Capital projects are organized by habitat limiting factors as defined in our salmon recovery plan. The activities in this work plan are presented in a matrix, which includes the following information:

- likely sponsor,
- status,
- total cost,
- external funding needed,
- amount and source of existing funding,
- scope of work and total cost for each year,
- expected end date, and
- additional funding needed after the first three years.

The Stillaguamish Technical Advisory Group (TAG) developed this three-year work plan with review by the Stillaguamish Implementation Review Committee (SIRC) and support from Stillaguamish Lead Entity staff.² The Stillaguamish Implementation Review Committee (SIRC) represents a broad range of local stakeholders for watershed stewardship and produced the Stillaguamish Watershed Chinook Salmon Recovery Plan with staff support from Snohomish County and the Stillaguamish Tribe.

Stillaguamish Salmon Recovery Plan Overview

Chinook salmon is the focus of recovery efforts in the Stillaguamish Watershed because the North and South Fork Stillaguamish Chinook populations are listed as threatened under the Endangered Species Act and past recovery efforts have proven to be inadequate. Restoration and protection of Chinook salmon habitat and watershed processes will benefit bull trout, which is

¹ Stillaguamish Implementation Review Committee (SIRC). 2005. Stillaguamish Watershed Chinook Salmon Recovery Plan. Snohomish County Public Works, Surface Water Management. Everett, WA.

² For more information about the Stillaguamish Lead Entity and this three-year work plan contact Sean Edwards at Snohomish County (425-388-3464 x4669) or Pat Stevenson at the Stillaguamish Tribe (360-435-2755 x27).

also listed as threatened, and steelhead trout, which is currently under review by NOAA for listing as threatened. Other salmon species, including coho, chum, pink, and sockeye salmon, and steelhead trout, will also benefit from implementation of this plan.

The Stillaguamish Chinook salmon recovery plan seeks to achieve low risk of extinction for both the North Fork and South Fork populations by implementing an integrated set of strategies for habitat protection and restoration, harvest management, and hatchery management. The plan also includes supporting strategies for stewardship education and outreach and monitoring and adaptive management. The plan assumes, based on habitat modeling, that by maintaining the overall harvest below the recovery exploitation rate, maintaining hatchery natural stock supplementation, protecting existing functional habitat, and improving degraded habitat it will be possible to recover the Stillaguamish Chinook populations to sustainable and harvestable levels. Stewardship education and outreach is primarily intended to bolster non-regulatory habitat protection and restoration. Monitoring and adaptive management provides for the focused research, data collection, and analysis that is necessary to know whether our integrated actions are producing the desired results for salmon recovery and whether we need to change our course of action.

Habitat Limiting Factors

The Stillaguamish Watershed Chinook Salmon Recovery Plan identifies six habitat limiting factors: riparian, estuary/nearshore, large woody debris, floodplain, sediment, and hydrology. These limiting factors are not ranked against each other to determine priorities for action. The TAG feels that based on its knowledge of ecological interactions there is no conclusive evidence that any one of the limiting factors is more or less important than the others for Stillaguamish Chinook salmon recovery. For example, large woody debris, riparian vegetation, sediment, and hydrology interact with each other to shape channel morphology and habitat. We think that all of these limiting factors are equally important in the formation and maintenance of salmon habitat in the Stillaguamish watershed.

The Plan defines properly functioning conditions for each of these six habitat limiting factors based on existing scientific knowledge about the habitat needs of Chinook salmon. Priority actions and geographic areas have been identified using extensive scientific data collected and analyzed over the past two decades. By analyzing the gap between existing habitat conditions and properly functioning conditions at the watershed, sub-basin, and stream reach scales for each limiting factor we have prioritized geographically specific actions that will give us the best return.

The Plan includes a detailed prescription of priority short-term (ten-year) habitat restoration and protection project types, geographic criteria, and specific “approved” projects that address the six habitat limiting factors listed in the Plan (see Chapter 5: Habitat Restoration Strategy, pp. 91-101). Habitat modeling predicts that implementation of these short-term actions will recover the Stillaguamish Chinook salmon populations to 30% of the long-term (50-year) combined population goal of about 33,000 fish. The following actions are specifically identified to restore and protect properly functioning habitat conditions:

Riparian: Plant native riparian vegetation, exclude livestock, protect existing native riparian vegetation, and control non-native invasive plants. Riparian actions are focused on restoring 400 acres of riparian forest on rural, urban, and agricultural lands that are not governed by existing private, state, or federal forest regulations within two geographic priority areas. The First Riparian Priority area includes the Upper North Fork Stillaguamish, Squire Creek, French-Segelsen, Lower Canyon Creek, and Lower South Fork Stillaguamish sub-basins. The Second Riparian Priority area includes the Middle North Fork Stillaguamish, Lower North Fork Stillaguamish, Jim Creek, and Lower Pilchuck Creek sub-basins. The Plan defers to the existing regulatory framework for riparian forest management on private, state, and federal forest lands.

Estuary/Nearshore: Restore blind tidal channels and tidal marsh habitats by removing and/or setting back dikes, restore pocket estuaries, restore or enhance marine shoreline habitat by removing bulkheads and planting native vegetation, retrofit existing tide gates, and construct log jams to enhance tidal channel formation in the river delta. Estuary and marine nearshore restoration actions are focused on three primary locations. These include restoration of 115 acres of tidal marsh habitat on WDFW's Leque Island property, restoration of 80 acres of tidal marsh habitat on The Nature Conservancy's property adjacent to the mouth of Hat Slough, and creation of 120 acres of new tidal marsh habitat by placing 10 engineered log jams on the mud/sand flats in front of the mouth of Hat Slough.

Large Woody Debris: Install engineered log jams in main river channels, stabilize eroding stream banks and landslides using large wood revetments, and regenerate mature trees for future instream recruitment. Specific actions to supplement large instream wood include installation of 51 engineered log jams within specific reaches of the North and South Forks. These reaches have relatively unmodified banks and are therefore expected to be more responsive to the floodplain and channel morphological effects of large instream wood.

Floodplain: Reconnect main river channels with side channels and sloughs, reconnect main river channels with floodplains and forested wetlands, remove and/or set back dikes and levees, remove bank armoring. Specific floodplain improvements include restoration of side channel habitat in the Lower Stillaguamish, Lower North Fork Stillaguamish, Middle North Fork Stillaguamish, and Lower South Fork Stillaguamish sub-basins. Removal of 4.1 miles of bank armoring is also prescribed for reaches above the confluence of the north and south forks of the Stillaguamish River.

Sediment: Stabilize large deep-seated landslides along main river channels using large wood revetments, decommission and treat forest roads in areas of steep and potentially unstable geology, restore wetlands to stabilize small tributary sediment regimes. Specific actions to reduce sediment impacts include remediation of the large deep-seated landslides at Steelhead Haven and Gold Basin and treatment of 106 miles of forest roads in the Upper North Fork, French-Segelsen, Deer Creek, Middle North Fork Stillaguamish, Upper Canyon Creek, Robe Valley, and Lower Canyon Creek sub-basins.

Hydrology: Restore floodplains to reduce peak flow and low flow impacts, reduce forest road density, increase hydrologically mature forest cover, identify optimum instream flow levels and

actions to reduce water consumption. Riparian vegetation, floodplain, and sediment projects should also contribute to restoring and protecting hydrologic functions.

Community Issues and Concerns

The SIRC seeks to build community support for salmon recovery by promoting actions that create voluntary partnerships, leverage matching funds, use resources efficiently and effectively, increase public knowledge and understanding of salmon recovery needs, and produce secondary community benefits. The SIRC has identified the following community issues and concerns, which help to guide our salmon recovery work program:

Riparian: Voluntary restoration and protection of riparian vegetation by land owners with technical and financial assistance from local organizations has proven to be effective for building community support in the Stillaguamish watershed. However, some riparian land owners believe that river bank trees exacerbate bank erosion and loss of property.

Estuary/Nearshore: Restoration of large scale estuary sites that are already managed for conservation is prioritized in order to establish local demonstration sites while respecting existing agricultural land uses. Duck hunters are concerned about losing walk-in access to existing estuary hunting areas on Leque Island. The farming community is also concerned about converting existing agricultural land for habitat conservation. Marine shore residents are concerned about protecting their properties from wave erosion and landslides.

Large Woody Debris: Installation of engineered log jams is focused upstream of the confluence of the north and south forks where there is less bank modification. Installation of engineered log jams may be viewed with concern by some floodplain residents and boaters who regard large woody debris in the river as a threat to public safety and private property.

Floodplain: Upstream floodplain restoration should provide benefits to fish and downstream human infrastructure. Reconnection of the North Meander in the Lower Mainstem is an important demonstration project that is centrally located within the agricultural community. Removal of dikes, levees, and bank armoring is viewed with skepticism by some stakeholders within the community, especially farmers and floodplain residents. A fundamental interest of the general public is the continued protection of life and property from flooding. However, an increasing number of people recognize flood protection benefits from some salmon restoration projects, such as wetland restoration, and regulations that limit clear cuts and impervious area.

Sediment: Stabilization of the deep-seated landslides at Steelhead Haven and Gold Basin and treatment of forest roads in areas with potentially unstable geology are widely recognized as local priorities for reducing sediment impacts on salmon habitat.

Hydrology: Actions that will contribute to flood hazard management, such as increasing flood storage and conveyance capacity, are generally supported by the local community. The potential for flood storage in the upper reaches of the North Fork and South Fork Stillaguamish and flood conveyance in the Lower Mainstem are particularly important. Historic forest practices, such as clear cut logging and forest road building, are recognized as having caused much of the hydrologic change in the Stillaguamish watershed.

Water Quality: Initiatives to protect and restore water quality were the foundation of the SIRC. The Stillaguamish community has worked hard for 15 years to clean up the watershed for all citizens. Water quality initiatives should continue and support salmon recovery work wherever possible.

Tribal Fishing Rights: The Stillaguamish Tribe and Tulalip Tribes have deep cultural and economic interests in viable salmon populations and their interests are protected by law. The Tribes will continue to be key partners for salmon recovery because they have a special stake in its success.

Agricultural Viability: To protect and restore riparian, floodplain, and estuary habitat on or near agricultural lands there must be incentives to enable farmers to participate while keeping farms viable and preventing more intensive land uses.

Forestry: Forest harvest, forest road building and forest practices on steep slopes and riparian areas need to be conducted with full consideration of habitat conditions and hydrology. Recent changes to the Washington State forest practice rules are encouraging. However, new forest practices must be funded, implemented and monitored if the changes are to be effective. The forestry community is reluctant to accept forest practice restrictions that go beyond those that have already been established through the Forest and Fish Agreement, Washington Department of Natural Resources Habitat Conservation Plan, and the Northwest Forest Plan. For example, recommendations for reduced road densities and increased hydrologically mature forest cover are of concern to private, state, and federal forest land managers.

Land Use Regulation: Voluntary habitat restoration alone will not be effective if environmental degradation continues due to population growth and urban/suburban development. Refinement and enforcement of local and state land use regulations and growth management policies are crucial for habitat restoration and protection.

Voluntary Actions: This strategy focuses on prioritizing specific reaches for voluntary habitat protection and restoration actions. These voluntary actions address community concerns that projects must rely on willing landowners, scientific justification, and efficient use of public resources.

Relationship to the Puget Sound Salmon Recovery Plan

The two Stillaguamish Chinook salmon populations are located in the Whidbey Basin, which is the main estuarine area for several major Chinook salmon producing rivers in Puget Sound and the migratory crossroads for most Puget Sound salmon populations. The regional plan states that the Whidbey Basin sub-region needs to keep all of its options open at this time to hedge against uncertainties in other sub-regions for achieving low risk populations. Restoring ecological processes in all four Whidbey Basin watersheds will benefit all of the other Puget Sound salmon populations. The Stillaguamish Chinook salmon populations are also regionally important because they are indicator stocks for West Coast fisheries.

The regional plan states that implementation of the Stillaguamish salmon recovery plan will help preserve recovery options in the Whidbey Basin. One of the regional strategies is to restore processes and habitats in and near estuarine deltas. This specifically includes implementing the Stillaguamish estuary restoration projects at Leque Island and The Nature Conservancy property.

The regional plan also identifies high water temperature in estuarine and shallow marine areas as a limiting factor for Puget Sound Chinook salmon. The Stillaguamish estuary is specifically identified as an area where this is likely to be the case and where restoration action should be taken.

The regional plan identifies the Stillaguamish salmon recovery plan as providing relatively low certainty of success for recovery because of the magnitude of change needed to achieve low risk for the two Stillaguamish Chinook salmon populations. If implemented this three-year work plan would improve our certainty of success because it would put us on track to make the necessary changes. For most limiting factors – including riparian vegetation, estuary, sediment – we would even be ahead of the pace necessary to achieve our ten-year habitat protection and restoration targets.

Stillaguamish Chinook Salmon Recovery Three-year Work Plan: 2007 - 2009

This three-year work plan includes activities for habitat protection and restoration, hatchery operation and start-up, habitat research and monitoring, salmon productivity monitoring, stewardship education and outreach, strategic planning, and watershed coordination. The South Fork population has been identified by NOAA as a high priority for recovery because the annual estimate of adult natural spawners has been less than 200 since 2003. Therefore this three-year work plan provides increased emphasis on Stillaguamish South Fork Chinook salmon recovery actions.

Habitat Protection and Restoration

Based on our understanding of Stillaguamish Chinook life history conditions and habitat limiting factors, we believe that egg to fry survival as well as freshwater and estuarine juvenile rearing must both be improved to achieve our recovery goals. The Stillaguamish Lead Entity and its partners seek to address these life history problems by prioritizing and implementing habitat protection and restoration projects.

Habitat protection will be accomplished through a combination of regulatory and non-regulatory activities. On the regulatory side, Snohomish County is in the process of updating its Critical Area Regulations and its Shoreline Master Program. Both regulatory programs will improve the protection of salmon habitat within the land use and shoreline management jurisdiction of Snohomish County. Snohomish County's pilot program for transfer of development rights to the City of Arlington should also help to protect the Stillaguamish River floodplain between Interstate 5 and Arlington. For the upper portions of the watershed we are relying heavily on the implementation and effectiveness of existing state and federal forestry regulations to protect and restore aquatic habitat and watershed processes. However, there is still some uncertainty about the effectiveness of the Forest and Fish regulations for reducing hydrologic impacts of forest practices in the Stillaguamish watershed.

On the non-regulatory side of the habitat protection strategy, this three-year work plan includes several potential acquisitions for a total of about 820 acres in the Deer Creek, Squire Creek, and Lower South Fork sub-basins. Habitat monitoring activities in this three-year work plan, such as the land cover analysis, will contribute to measuring the effectiveness of our habitat protection strategy.

For habitat restoration our three-year work plan includes a mix of general and specific actions that are either underway or proposed for implementation during this three-year period. If implemented, these actions will meet or exceed most of our three-year pro-rated targets, which we have derived from our ten-year habitat restoration strategy for each of the six habitat limiting factors. Acquisition and fish passage projects are also included. Table 1 below summarizes the habitat gains that we expect to make from our three-year work plan compared to our three-year prorated habitat targets. Most of our habitat targets for this three-year work plan exceed the prorated targets. This demonstrates that our strategy is focused and our pace of implementation is ambitious. Our most challenging habitat targets are the creation of new tidal marsh in the estuary, construction of large river engineered long jams, and the removal of bank armoring.

Table 1: Habitat targets for this three-year work plan compared to three-year prorated habitat targets from ten-year habitat strategy.

| Project Type | Targets for 3-Year Work Plan | 3-Year Prorated Targets from 10-Year Strategy |
|---------------------|---|--|
| Riparian Vegetation | 282 ac. planted | 120 ac. planted |
| Estuary/Nearshore | 245 ac. restored 36 ac. created | 195 ac. restored 36 ac. created |
| Large Wood | 10 large river ELJs 15 wadable stream ELJs | 16 large river ELJs |
| Floodplain | 19.3 ac. side channel restored bank armoring removal feasibility study | 12 ac. side channel restored 1.37 mi. bank armoring removed |
| Sediment | 1 slide treated 36 mi. forest roads treated | 1 slide treated 31.8 mi. forest roads treated |
| Acquisition | 820 ac. acquired | 432 ac. acquired |
| Fish Passage | 7 mi. improved fish passage | None |

Riparian Vegetation

Between the Stillaguamish Tribe’s Riparian Restoration Crew project and Snohomish County’s South Fork Big Trees project, approximately 280 acres of riparian forest are funded for restoration. These two projects alone represent more than half of our ten-year target of 400 acres. The Forest Service proposal to block vehicular access to streams and riparian areas in the Upper South Fork subbasin will also contribute to riparian protection and restoration.

Estuary/Nearshore

Ducks Unlimited and The Nature Conservancy are in the process of designing projects that will restore 245 acres of tidal marsh habitat. This will exceed our ten-year target of 195 acres of tidal marsh restoration. It should also be noted that The Nature Conservancy is planning to include an experimental component in its restoration project that will help to answer technical questions about the effectiveness of estuary restoration in Puget Sound. The ten-year target for creating 36

acres of new tidal marsh will be revisited in light of the broader research and comprehensive estuary restoration planning that will occur during this three-year time period. The Nature Conservancy, WDFW, and Snohomish County will also continue their *Spartina* control efforts.

Large Woody Debris

The ten-year prorated large woody debris target is 16 large river engineered log jams (ELJs). Snohomish County is currently studying the feasibility of potential ELJ locations in the South Fork Stillaguamish River below Granite Falls. This analysis will support the design and installation of work for ten large river ELJs. The Stillaguamish Tribe, in partnership with the Forest Service, has an existing SRFB proposal to install 15 wadable stream ELJs as part of the North Fork Road Relocation and Instream Temperature Reduction project. The Washington Department of Natural Resources is also negotiating with Snohomish County to set up a large wood supply program for instream restoration projects in the Stillaguamish watershed.

Floodplain

The ten-year prorated floodplain targets include restoration of 12 acres of side channel habitat and removal of 1.37 acres of bank armoring. Snohomish County's North and South Meander side channel reconnection projects would restore approximately 8.6 acres in the Lower Mainstem side channel habitat. Approximately 10.7 acres of North Fork side channel habitat would also be restored by the Smoke Farm, Pentland Creek, and Blue Slough restoration projects. Looking beyond this three-year time period, reconnection of the South Slough could restore an additional 11 acres of additional side channel habitat in the Lower Mainstem floodplain. As stated in the Stillaguamish salmon recovery plan the SIRC will organize a subcommittee to develop a comprehensive floodplain function strategy with participation by representatives of local, state, and federal agencies that have floodplain regulatory responsibility (SIRC 2005, p. 162). This strategic planning effort will be supported by Snohomish County with technical analysis in the form of bank armoring removal feasibility studies and a reach scale river restoration analysis. These floodplain function strategic planning activities will position us to meet our 10-year targets by providing the technical foundation for a public discussion about how and where we should restore watershed processes in the floodplain.

Sediment

This winter the Steelhead Haven landslide was exacerbated by another major slide that forced the North Fork into a new channel and threatened about a dozen homes. The Stillaguamish Tribe is currently re-evaluating the feasibility and design of its original Steelhead Haven Landslide Remediation project funded by the SRFB. Our three-year work plan assumes that the Tribe will be able to implement a redesigned project that will help stabilize the slide and reduce the amount of sediment entering the river. The Tribe's Segelsen Road Erosion Control Project, in partnership with the Forest Service, will treat about 12 miles of forest roads in the North Fork. Four other projects proposed by the Forest Service would treat an additional 23 miles of forest roads in the Squire Creek, Deer Creek, and Canyon Creek sub-basins.

Hydrology

Several of the actions outlined in the 2007-2009 work plan if implemented will have positive effects on the hydrology in the Stillaguamish watershed. Examples include decreasing road densities, acquisition of forest lands, increasing the percentage of mature forest, planting riparian

vegetation and removing hardened banks allowing the river a connection to its floodplain. Many of the actions needed to restore the system hydrology to a functional state are regulatory and fit more in the protection realm. State and federal forest practice rules must limit the amount of the basin in an immature state especially in the rain on snow zone. The overall road density in the basin should be reduced to allow a more natural flow pattern. The increasing peak flow trend should be reversed. At the opposite extreme instream flows must be managed to accommodate increasing fish populations. Currently there are not sufficient amounts of water called for in the instream flow rule during the critical migration and spawning season.

Water Quality

Several of the actions outlined in the 2007-2009 work plan if implemented will have positive effects on water quality in the watershed. Planting riparian forests, reducing sediment from roads and landslide activity, reconnecting the river to the floodplain are all examples of actions leading to reduced temperature and sediment loading. As with hydrology many of the actions necessary to improve water quality are regulatory in nature. The watershed is currently involved in the Total Maximum Daily Load (TMDL) implementation process to reduce fecal coliform, temperature, and heavy metals and increase dissolved oxygen levels. The watershed is also involved in implementing National Pollution Discharge Elimination System (NPDES) permits for direct discharges into the water. With the onset of urbanization in the watershed the nature of water quality impacts can change by increasing amounts of heavy metals and toxics entering the water. Samples taken by the Stillaguamish Tribe recently reflect this.

Later this year Ecology will issue NPDES stormwater a Phase I permit to Snohomish County and a Phase II permit to the City of Arlington. These jurisdictions will be required to implement a number of programs related to reducing the impacts of stormwater on receiving waters including the Stillaguamish River and Port Susan. Other NPDES permits (industries, waste water treatment plants, construction stormwater) also require treatment of effluent discharge to reduce or prevent impacts to receiving waters. Snohomish County and the City of Arlington are also implementing Low Impact Design alternatives to reduce stormwater impacts to the watershed.

Ecology's 2004 Water Quality Assessment (303d list) has two Category 5 listings for temperature for the Old Stillaguamish Channel. Over the next three years Ecology will be conducting the Old Stillaguamish Channel Dissolved Oxygen TMDL, and this will require some temperature data from West Pass and South Pass, at least for the critical period of July through October. Monitoring will be conducted in 2006 or 2007. Measurements will include nutrients, BOD, dissolved oxygen, temperature, and turbidity.

Snohomish County, the Stillaguamish Tribe, the City of Arlington, and the Washington Department of Ecology have existing water quality monitoring programs and a coordinated network of sampling sites in the watershed. Water quality monitoring will also be conducted as part of the following projects: Snohomish County's South Fork Big Trees project, the Stillaguamish Tribe's Steelhead Haven Landslide Remediation project, and the Snohomish Conservation District's Fish Creek Sub-basin project.

Fish Passage

The Stillaguamish salmon recovery plan does not specifically include priorities for fish passage because it is not a limiting factor for the Stillaguamish Chinook salmon populations. However, our three-year work plan includes several fish passage projects that will benefit bull trout, steelhead, and coho salmon. An assessment of fish passage problems associated with the Granite Falls Fish Ladder is also included because tribal co-managers have long-standing concerns about the effectiveness of this WDFW facility.

Hatchery Management

Maintenance of the Stillaguamish Tribe's North Fork Chinook salmon conservation hatchery operation is included in our three-year work plan along with scoping and conditional start-up for a new South Fork Chinook hatchery program. These hatchery activities are currently necessary to prevent the continued decline and eventual extinction of these two populations. The Tribe's mainstem smolt trap operation is also included in this work plan because it produces essential information needed to estimate productivity of the North and South Fork Chinook salmon populations. Without the smolt trap operation we would have no way to accurately measure fish productivity within the watershed.

Harvest Management

Stillaguamish Chinook are managed under the Comanagers' Chinook Harvest Management Plan³, which calls for the annual cumulative harvest-related mortality of Stillaguamish Chinook to remain below a recovery exploitation rate (RER). This rate was derived based on current productivity and capacity such that harvest would not be an impediment to recovery, assuming that the habitat and hatchery actions in this plan are implemented and effective. The RER was derived using production data through 1999 and using data from only the North Fork population. This work plan includes a reassessment of North Fork productivity and capacity using more recent data as well as a determination of whether an RER can be developed for the South Fork population. Recomputation of RERs is necessary to assure that the harvest management plan will continue to be compatible with the hatchery and habitat management plans.

Annual assessment of escapement (including estimates of total numbers by population and of the contribution of hatchery-origin fish to each population) is conducted for evaluation of the harvest management and hatchery programs. However, this is the basic stock assessment tool that is used for assessing the effectiveness of the entire plan in promoting population recovery. Acoustic monitoring tools are being considered because it is difficult to perform adult spawning surveys in the South Fork due to high turbidity from the Gold Basin landslide.

Along with its direct contribution to population recovery, the North Fork hatchery program provides a critical harvest management tool because the fish are coded-wire tagged (CWT) and serve as an exploitation rate indicator stock. Analysis of CWTs recovered from this program enables us to estimate annual and brood year exploitation rates as well as the reconstruction of total abundance and productivity for the North Fork population. Funds for the North Fork

³ Puget Sound Indian Tribes and Washington Department of Fish and Wildlife. 2004. Comprehensive management plan for Puget Sound Chinook: Harvest management component. Northwest Indian Fisheries Commission, Olympia, Washington, USA. 247 pages.

enhancement program, as well as escapement surveys, are critical for this work to be effective. In addition, fishery management agencies from Alaska to Oregon expend significant funds for CWT recovery and analysis, which are not reflected in this three-year work plan.

Stewardship Education and Outreach

This three-year work plan includes general staff support for implementation of our stewardship education and outreach strategy. This is presented in terms of two Full Time Equivalent (FTE) staff positions, but it is intended to serve as a placeholder for funding that could be provided to multiple partner organizations that are helping to implement this strategy. Community engagement priorities during the 2007 – 2009 period include farmland preservation, estuary restoration, floodplain function, bank armoring removal, ELJ locations, forest stewardship, instream flow, and water quality.

Specifically, the work plan includes the Stilly-Snohomish Fisheries Enhancement Task Force's Restoration Education for Young Stewards (REYS) program, which has been well received in the local community. The Forest Service is also proposing a new Stillaguamish Watershed Stewards program that would provide targeted stewardship education and outreach to national forest users.

Education and outreach to children and young adults is not identified as a priority in our stewardship education and outreach strategy. However, it is widely recognized that educating young people will contribute to implementation of our salmon recovery plan by raising public awareness, engagement, and support for the long-term (50-year) salmon recovery effort.

Monitoring and Adaptive Management

The Stillaguamish Watershed Chinook Salmon Recovery Plan includes a Monitoring and Adaptive Management Strategy that is designed to evaluate implementation and effectiveness of the actions called for in the Plan. Findings derived from this evaluation process will be used to guide the development and prioritization of future capital and non-capital actions. This evaluation process will also help refine our understanding of local community values, which may change over time as we continue to learn what is needed to recover salmon and what types of actions are both effective for salmon recovery and acceptable to the community.

This three-year work plan includes staff support for implementation of our monitoring and adaptive management strategy, which includes annual data collection, analysis, and reporting of findings and recommendations to the SIRC each year in April. Line items are also included to conduct habitat monitoring field work, basin-wide remote sensing analysis of ecological landscape conditions, and habitat modeling. Field work includes Snohomish County's large river and wadable stream surveys and the Stillaguamish Tribe and Snohomish County's fine sediment studies for the North Fork and South Fork. Snohomish County will also conduct another iteration of its land cover classification and analysis. If funded, the Tulalip Tribes and the Stillaguamish Tribe will coordinate a modeling effort to generate predicted population effects of our integrated habitat, harvest, and hatchery activities. Potential modeling tools may include the Ecosystem Diagnosis and Treatment (EDT), SHIRAZ, and All H-Analyzer (AHA) methods.

The implementation and effectiveness of regulatory and non-regulatory protection measures will be evaluated as described in our monitoring and adaptive management strategy. Findings and recommendations will be reported to the SIRC. The SIRC will then have the opportunity to advise any responsible parties regarding adaptive management responses that might be needed for habitat protection.

Strategic Planning

In order to achieve our ten-year and long-term targets for floodplain and estuary restoration it is becoming increasingly clear that we need to conduct more focused strategic planning with the local community. Therefore, this three-year work plan includes line items to develop comprehensive floodplain and estuary restoration strategies. Floodplain strategic planning needs to begin soon because there is a lot of uncertainty about how we are going to meet our 10-year bank armoring removal target and our long-term side channel restoration target. On the other hand we are currently on track to exceed our ten-year tidal marsh restoration target, so long-term estuary strategic planning is not as urgent.

Snohomish County is currently conducting an inventory and analysis of existing farmland and farmland preservation needs. This information will be an important building block for community engagement because there is local concern about conversion of existing farmland to estuary, floodplain, and riparian habitat. Strategic planning for floodplain function is proposed to start with scoping in 2007 and proceed to implementation in 2008. This effort will be coordinated with the SIRC's floodplain function strategy subcommittee (SIRC 2005, p. 162). This will also be an opportunity to examine the relationship between the Stillaguamish salmon recovery plan and Snohomish County's Stillaguamish River Comprehensive Flood Hazard Management Plan.

Scoping for the estuary strategic planning effort would begin in 2008 and be implemented in 2009. This effort should be coordinated with the SIRC's Replacement Lands Subcommittee, which is currently examining the issues associated with the overlapping priorities of estuary restoration, farmland preservation, waterfowl habitat management, public access, and flood hazard management. Estuary strategic planning should also evaluate whether delta log jams are beneficial to creating tidal marsh habitat before implementing a project that uses them.

Watershed Coordination

Coordination of these salmon recovery activities is the responsibility of the Stillaguamish Lead Entity, which is administered cooperatively by Snohomish County and the Stillaguamish Tribe. Lead entity administration is supported by the WDFW Lead Entity Program, which provides approximately \$60,000 per year to Snohomish County. Snohomish County subcontracts about one third of the grant and related duties to the Stillaguamish Tribe. Snohomish County provides additional staff and resource support for salmon recovery through its watershed stewardship, habitat restoration, drainage infrastructure, and water quality monitoring work programs. Similarly, the Stillaguamish Tribe supplements salmon recovery with its extensive fishery management, habitat restoration, and water quality work programs. The City of Arlington also provides a significant investment by allowing staff to chair the SIRC and participate in local and regional salmon recovery activities. Additional staffing capacity for project feasibility studies,

design, implementation, and maintenance is built into the cost of capital activities listed in the matrix.

Currently Snohomish County is updating its habitat work schedule database, with Stillaguamish Tribe participation, to make it a web-based interactive tool that our salmon recovery partners will be able to use for querying, editing, mapping, and reporting information about salmon recovery projects and priorities. This will provide a valuable mechanism for tracking our progress, coordinating our respective efforts, and providing accountability to the public. We expect to bring the new database on line before the end of this year.

The total cost of this 3-year work plan is approximately \$22 million. Of this total, about \$16 million is for capital projects and about \$6 million is for non-capital activities. External funding needed is about \$12 million, of which about \$9 million is needed for capital projects and \$3 million for non-capital activities. In our Stillaguamish salmon recovery plan we estimated the cost of our ten-year habitat strategy, not including non-capital activities, at about \$44 million (SIRC 2005, p. 100). Therefore the capital project cost of our three-work plan represents about 36% of our original ten-year cost estimate. This seems like a reasonable amount considering that we are trying to set a strong early pace of implementation in order to increase the certainty of achieving low risk of extinction for both of the Stillaguamish Chinook salmon populations.

Tiering of activities in this three-year work plan is limited to scoping of operations for each line item over the 2007 – 2009 time period. Line items are not tiered against each other because we believe tiering is a lower priority at this time. If and when choices must be made about how to allocate any new funding we will decide such issues in a public forum with the TAG and SIRC.

One of the most important keys to our success in the Stillaguamish Watershed is the active participation of our private citizens on the SIRC. They are the catalyst of trust that enables us to build projects on private land. They are tirelessly committed to attend public meetings and interact with their fellow citizens in order to learn what is necessary for salmon recovery while sharing how salmon recovery actions may impact the community and individuals. Maintaining this strong community involvement depends on ensuring that everybody at the table has the opportunity to share their thoughts so we can find the solutions that we can implement in a mutually beneficial manner. This three-year work plan should serve as a useful tool for the SIRC, TAG, and Stillaguamish Lead Entity staff to communicate our salmon recovery priorities with the local community, elected officials, project sponsors, and potential funding agents.

Three-Year Stillaguamish Salmon Recovery Work Plan: 2007 - 2009

| Project Type | Units | Quantity | Likely Sponsor | Project/Program Status | Total Cost of First 3 Years | Additional Funding Needed | Existing Funding | Source of Existing Funds | 2007 | | | 2008 | | | Likely End Date | Additional Funds Needed After 2009 | | |
|-------------------------------|--|--------------|--|---|-----------------------------|---------------------------|------------------|---|---------------------------------------|---|--------------|--|--------------|--|--|-------------------------------------|--|-----|
| | | | | | | | | | Year 1 Scope | Year 1 Total Cost | Year 2 Scope | Year 2 Total Cost | Year 3 Scope | Year 3 Total Cost | | | | |
| Capital projects and programs | | | | | | | | | | | | | | | | | | |
| Riparian | Acres planted (Riparian Restoration Crew) | 755 | Stillaguamish Tribe, Snohomish County | Planning complete, landowner negotiations | \$1,390,000 | \$0 | \$1,390,000 | SRFB, Snohomish County (inmate labor) | Stillaguamish Tribe, Snohomish County | Design complete, in permitting | \$926,667 | \$926,667 | \$926,667 | SRFB, Snohomish County (inmate labor) | Stillaguamish Tribe, Snohomish County | Design complete, in permit | | |
| | Acres planted (South Fork Big Trees) | 77 | Snohomish County | Contract negotiation w/ DOE | \$325,000 | \$0 | \$325,000 | DOE, Snohomish County | | Planting and construction | \$150,000 | | \$100,000 | | Planting, construction, and monitoring | \$75,000 | 2011 | \$0 |
| | Sites protected (block vehicular access to streams/riparian areas in upper SF Stillaguamish) | 3 | USFS, Friends of the Forest | Preliminary review | \$10,000 | \$10,000 | \$0 | NA | NA | NA | \$0 | Construction | \$10,000 | NA | \$0 | 2008 | \$0 | |
| Estuary | Acres tidal marsh restored (TNC diked upland) | 115 | Ducks Unlimited, WDFW | Engineering design | \$805,000 | \$120,000 | \$685,000 | SRFB, Ducks Unlimited | | Final design, permitting | \$37,000 | Construction | \$520,000 | Finish work, final reports | \$10,000 | 2009 | \$0 | |
| | Acres tidal marsh restored (TNC diked upland) | 130 | TNC | Engineering design | \$896,000 | \$776,000 | \$120,000 | TNC | | Final design, permitting, baseline monitoring | \$82,000 | Site prep, construction | \$137,000 | Construction | \$682,000 | 2009 | \$0 | |
| | Acres tidal marsh created | 36 | Stillaguamish Tribe, Tulalip Tribes, TNC | Feasibility/conceptual | \$240,000 | \$205,000 | \$35,000 | Ball Estate TNC, Snohomish County | | Feasibility | \$66,000 | Assessment | \$66,000 | Design | \$108,000 | 2013 | \$560,000 | |
| | Spawning channel | Estuary-wide | TNC, Snohomish County, WDFW | Design | \$435,000 | \$206,000 | \$229,000 | WDFW | | Treatment, monitoring | \$145,000 | Treatment, monitoring | \$145,000 | Treatment, monitoring | \$145,000 | Ongoing | | |
| Large Wood | Large river ELTs | 10 | Stillaguamish Tribe, Snohomish County, Sno. Cons. District | Scoping | \$1,500,000 | \$1,400,000 | \$100,000 | Wood, design | | Engineering and design | \$200,000 | Land acquisition, permitting | \$300,000 | Install ELTs | \$1,000,000 | 2015 | \$5,500,000 | |
| | Wadable stream ELTs (North Fork Road Relocation and Instream) | 15 | Stillaguamish Tribe, USFS | SRFB proposal ready | \$300,000 | \$255,000 | \$45,000 | USFS (materials) | | Design, permit | \$30,000 | Site prep, construction | \$220,000 | Finish work, start to monitor | \$50,000 | 2009 | \$20,000 (outyear monitoring) | |
| | # of pieces (wood supply, transportation, and storage) | 100 | DNR, Snohomish County | In negotiations | \$150,000 | \$0 | \$150,000 | DNR (wood) | | Provide wood, transportation and storage | \$50,000 | Provide wood, transportation and storage | \$50,000 | Provide wood, transportation and storage | \$50,000 | 2015 | \$300,000 | |
| Floodplain | Miles armoring removed | 1.37 | Snohomish County, Army Corps | Not started | \$300,000 | \$250,000 | \$50,000 | Snohomish County (design) | | NA | \$0 | Feasibility | \$100,000 | Landowner agreements, easements, or fee simple | \$200,000 | 2015 | \$5,000,000 | |
| | Acres restored (North Meander) | 4.6 | Snohomish County | Construction | \$455,000 | \$0 | \$455,000 | SRFB, Snohomish County | | Construction | \$425,000 | Site maintenance | \$15,000 | Site maintenance | \$15,000 | 2009 | \$0 | |
| | Acres restored (South Meander) | 4 | Snohomish County | Feasibility assessment in progress | \$1,300,000 | \$1,275,000 | \$25,000 | Snohomish County (design, wood, bridges) | | Negotiation, agreements, final design and engineering | \$150,000 | Final design, site prep, and construction | \$200,000 | Construction, planting, LWD | \$950,000 | 2009 | \$500,000 (Phase III) | |
| | Acres restored (Smoke Farm) | 4 | Cascade Land Conservancy, NRCS, Snohomish County | Acquisition complete, design | \$438,000 | \$0 | \$438,000 | SRFB, CLC, NRCS Wetland Reserve Program | | Design, permitting, riparian planting | \$60,000 | Dike removal, vegetation monitoring, final reports | \$100,000 | Site maintenance | \$18,000 | 2009 | \$0 | |
| | Acres restored (Perland Creek) | 3 | Snohomish Conservation District | Permitting | \$264,000 | \$0 | \$264,000 | SRFB, Snohomish Conservation District | | Instream monitoring, planting | \$120,000 | Vegetation monitoring, final reports | \$8,000 | Vegetation monitoring | \$4,000 | 2010 | \$0 | |
| | Acres restored (Blue Slough) | 3.7 | Stillaguamish Tribe | In negotiations | \$525,000 | \$446,250 | \$78,750 | Stillaguamish Tribe (design, wood, bridges) | | Negotiation, agreements, final design and engineering | \$75,000 | Site prep, construction | \$350,000 | Add wood and plant | \$100,000 | 2009 | \$0 | |
| | Acres restored (South Slough) | 11 | Snohomish County | Not started | \$350,000 | \$300,000 | \$50,000 | Snohomish County (design, wood, bridges) | | Alternatives analysis and feasibility | \$50,000 | Detailed preliminary design | \$200,000 | Landowner agreements, easements, or fee simple | \$100,000 | 2013 | Unknown until preliminary design completed | |
| Sediment | Landslide treatment (Steelhead Haven) | 1 | Stillaguamish Tribe | Design complete, in permitting | \$1,000,000 | \$0 | \$1,000,000 | SRFB, DOE, Stillaguamish Tribe (wood, design) | | Engineering and design, site prep | \$150,000 | Construction | \$1,100,000 | Construction | \$1,000,000 | 2015 | \$3,500,000 | |
| | Miles erosion control (Geoplen Rd. 18) | 12.3 | Snohomish Conservation District, USFS | Design, contract negotiation w/ SRFB | \$356,000 | \$0 | \$356,000 | SRFB, Snohomish Conservation District, USFS (inmate design) | | Construction | \$356,000 | NA | \$0 | NA | \$0 | 2007 | \$0 | |
| | Miles erosion control (Deer Creek Headwaters Rd. 18) | 8.5 | USFS, Snohomish Conservation District | Inventory done; need design and contract prep | \$260,000 | \$260,000 | \$0 | NA | | NA | \$0 | NEPA, design, contract prep and award, begin work | \$220,000 | Finish work, start to monitor | \$30,000 | 2009 | \$0 | |
| | Miles erosion control (NF Canyon Creek Rd. 4150 and Saps) | 12.6 | USFS, Stillaguamish Tribe | cursory review of portions; washout, not fully accessible; require NEPA | \$425,000 | \$425,000 | \$0 | NA | | Complete field review and NEPA | \$48,000 | Contract prep and award, begin work | \$226,000 | Finish work, start to monitor | \$151,000 | 2009 | \$0 | |
| | Miles Erosion Control (Hempe Creek Rd. 4009) | 0.6 | Tulalip Tribes, USFS | Initial field review completed 2008 | \$40,000 | \$28,500 | \$11,500 | Tulalip Tribes; proposed for BAC funds in 2007 | | Inventory, design, permit, construction | \$40,000 | NA | \$0 | NA | NA | 2008 | \$0 | |
| | Miles Stormproof (Squire Creek Rd. 2040) | 2 | Stillaguamish Tribe or SCD or USFS | Large landslide in 2002 removed road at MP 2.1; need to address drainage and reduce sedimentation | \$50,000 | \$42,500 | \$7,500 | SCD | | Design, permit | \$7,500 | Stormproof | \$42,500 | NA | NA | 2008 | \$0 | |
| Acquisition | Acres (Squire Creek Mining Claims) | 700 | Stillaguamish Tribe, USFS | Partial harvest; ongoing activity | \$800,000 | \$800,000 | \$0 | NA | | Negotiation, purchase contract | \$40,000 | Acquire | \$760,000 | NA | NA | 2008 | \$0 | |
| | Acres (Port Blakely parcels in Little Deer Creek) | 480 | Stillaguamish Tribe, USFS | In-holdings zoned for 1hs/20ac; includes wetlands, old growth, and last untreated roads in Little Deer drainage | \$385,000 | \$385,000 | \$0 | NA | | Acquire | \$385,000 | NA | NA | NA | NA | 2012 (see note re additional funds) | Restoration in outyears after acquisition: riparian re-establishment (\$132K); road treatment (\$83K); instream roughness (\$165K) | |
| | Acres (floodplain acquisition) | 140 | City of Arlington | In negotiations | \$1,200,000 | \$1,020,000 | \$180,000 | City of Arlington | | Negotiate agreement, purchase | \$1,020,000 | NA | NA | NA | NA | 2007 | \$0 | |
| | Acres (transfer of development rights) | 1,700 | Snohomish County, City of Arlington | TDR program approved by Snohomish County and City of Arlington, in negotiations w/ ag and development communities | \$60,000 | \$0 | \$60,000 | Snohomish County | | TDR Administration (0.25 FTE) | \$20,000 | TDR Administration (0.25 FTE) | \$20,000 | TDR Administration (0.25 FTE) | \$20,000 | Ongoing | | |
| Fish Passage | Miles of access improved (Harvey-Armstrong) | 4 | Snohomish County, Stillaguamish Tribe, WDFW | Design complete | \$500,000 | \$450,000 | \$50,000 | Snohomish County | | Complete design, permit | \$50,000 | Prep site, construct | \$400,000 | Complete construction | \$50,000 | 2009 | \$0 | |
| | Miles restored (Palmer Creek Fish Passage) | 1.7 | USFS | Culvert-to-bridge to open 1.7 miles to coho, bull trout, steelhead; sought FS funds but not funded | \$730,000 | \$195,500 | \$534,500 | USFS | | Design, permit | \$50,000 | Construct | \$180,000 | NA | NA | 2008 | \$0 | |
| | Miles restored (Big Four Fish Passage) | 1.3 | Snohomish County | Preliminary design | \$85,000 | \$35,000 | \$50,000 | Snohomish County Road Fund or real estate excise taxes | | Design | \$10,000 | Construct | \$75,000 | NA | NA | 2008 | \$0 | |

| Project Type | Units | Quantity | Likely Sponsor | Project/Program Status | Total Cost of First 3 Years | Additional Funding Needed | Existing Funding | Source of Existing Funds | 2007 | | | 2008 | | | Likely End Date | Additional Funds Needed After 2009 |
|---|--|---|--|--|-----------------------------|---------------------------|--------------------|---|--|--------------------|---|--------------------|--|--------------------|--------------------------------------|------------------------------------|
| | | | | | | | | | Year 1 Scope | Year 1 Total Cost | Year 2 Scope | Year 2 Total Cost | Year 3 Scope | Year 3 Total Cost | | |
| | Fish passage culverts | 3 | Snohomish County | Preliminary design | \$450,000 | \$300,000 | \$150,000 | Snohomish County | Design, permit, construct | 150,000 | Design, permit, construct | 150,000 | Design, permit, construct | \$150,000 | Ongoing | |
| | Granite Falls fish ladder improvement | Upper South Fork | Stillaguamish Tribe, WDFW | In negotiations | \$10,000 | \$0 | \$10,000 | Stillaguamish Tribe, WDFW | Negotiation, scoping | \$10,000 | NA | \$0 | NA | \$0 | 2009 | \$0 |
| | | | Total capital need | | \$15,534,000 | \$9,184,750 | \$6,349,250 | | Total year 1 | \$3,971,500 | Total year 2 | \$6,616,167 | Total year 3 | \$4,908,000 | | |
| Non-capital needs | | | | | | | | | | | | | | | | |
| Hatchery | # of smolts (NF Chinook Hatchery Program) | 220,000 | Stillaguamish Tribe and WDFW | Ongoing | \$1,788,000 | \$375,000 | \$1,413,000 | BIA plus US/Canada Funding | Ongoing operations: broodstocking, rearing, tagging | \$596,000 | Ongoing operations: broodstocking, rearing, tagging | \$596,000 | Ongoing operations: broodstocking, rearing, tagging | \$596,000 | Ongoing | |
| | # of smolts (SF Chinook Hatchery Program) | 100,000 to 150,000 smolts | Stillaguamish Tribe and WDFW | Ongoing | \$420,000 | \$420,000 | \$0 | NA | Staffing (1 FTE) plus startup and operations | \$140,000 | Ongoing staffing (1FTE) and operations | \$140,000 | Ongoing staffing (1FTE) and operations | \$140,000 | Ongoing | |
| Harvest | Escapement survey | Program | Stillaguamish Tribe, WDFW | Ongoing | \$360,000 | \$180,000 | \$180,000 | Stillaguamish Tribe, WDFW | Ground and helicopter surveys | \$120,000 | Ground and helicopter surveys | \$120,000 | Ground and helicopter surveys | \$120,000 | Ongoing | |
| Stewardship | Stewardship education and outreach | Program | Snohomish County, Stillaguamish Tribe, USFS, WDFW, Sno. Cons. District, Beach Watchers, TNC, City of Arlington | Ongoing | \$450,000 | \$375,000 | \$75,000 | Stillaguamish Tribe, Snohomish County | Staffing (2 FTE) | \$150,000 | Staffing (1 FTE) | \$150,000 | Staffing (1 FTE) | \$150,000 | Ongoing | |
| | Stillaguamish Watershed Stewards | Program | USFS, Stillaguamish Tribe, Friends of the Forest | Ongoing | \$50,000 | \$25,000 | \$25,000 | SSFETP, FOE, USFS | Set up training and program for volunteers; produce info flyers; do inventories and educational outreaches; produce map and report | \$50,000 | NA | NA | NA | NA | 2007 | \$0 |
| Monitoring & Adaptive Management | Restoration Education for Young Stewards | Program | Stillaguamish Tribe, USFS | Ongoing | \$33,600 | \$30,000 | \$3,600 | SSFETP | Staffing & materials for in-class field education | \$11,200 | Staffing & materials for in-class field education | \$11,200 | Staffing & materials for in-class field education | \$11,200 | Ongoing | |
| | Monitoring and adaptive management | Program | Multiple stakeholders | Ongoing | \$225,000 | \$200,000 | \$25,000 | Stillaguamish Tribe, Snohomish County | Staffing (1 FTE) | \$75,000 | Staffing (1 FTE) | \$75,000 | Staffing (1 FTE) | \$75,000 | Ongoing | |
| | Mainstem juvenile outmigrant trap | Production estimation | Stillaguamish Tribe | Ongoing | \$225,000 | \$165,000 | \$60,000 | Stillaguamish Tribe | Staffing and equipment | \$75,000 | Ongoing staffing | \$75,000 | Ongoing staffing | \$75,000 | Ongoing | |
| | Coded-wire tagged fish released | 200,000/year | Stillaguamish Tribe (tagging); multiple agencies (tag recovery, reading, and analysis) | Ongoing | \$78,000 | \$0 | \$78,000 | Stillaguamish Tribe, PST Implementation funds, coastwide agency budgets | Staffing and equipment | \$26,000 | Staffing and equipment | \$26,000 | Staffing and equipment | \$26,000 | Ongoing | |
| | Reassessment of Recovery Exploitation Rate (RER) | Possibly revised harvest management guideline for NF and SF populations | Tulalip Tribes, WDFW | Not started | \$10,000 | \$10,000 | \$0 | NA | NA | \$0 | Review/revise RER for NF; consult RER for SF | \$10,000 | NA | \$0 | 2008 | \$0 |
| | Water quality monitoring | Multiple sampling sites | Snohomish County, Stillaguamish Tribe, City of Arlington | Ongoing | \$750,000 | \$0 | \$750,000 | Tribe (EPA), Snohomish County | Sampling, analysis, reporting | \$250,000 | Sampling, analysis, reporting | \$250,000 | Sampling, analysis, reporting | \$250,000 | Ongoing | Water quality monitoring |
| | Large river survey | 80 miles | Snohomish County, Stillaguamish Tribe | Ongoing (every 5 years) | \$480,000 | \$408,000 | \$72,000 | Snohomish County, Stillaguamish Tribe | Perform survey using standard protocol | \$400,000 | Report | \$80,000 | NA | NA | Ongoing (every 5 years through 2055) | \$4,500,000 |
| | Wadable stream survey | 30 miles | Snohomish County, Stillaguamish Tribe, Tulalip Tribes, USFS | Ongoing | \$540,000 | \$459,000 | \$81,000 | Snohomish County, Stillaguamish Tribe, USFS | Perform survey using standard protocol | \$180,000 | Report; perform survey using standard protocol | \$180,000 | Report; perform survey using standard protocol | \$180,000 | Ongoing | \$5,400,000 |
| | Land cover classification and analysis | Basin wide | Snohomish County | Ongoing (every 5 years) | \$20,000 | \$0 | \$20,000 | Snohomish County | Classify 2006 imagery and provide derivative products relevant to monitoring elements in 2005 Plan | \$20,000 | NA | NA | NA | NA | Ongoing (every 5 years through 2055) | \$1,000,000 |
| | Fine sediment data collection and analysis | 30 miles | Stillaguamish Tribe | NF data collection began in 2005; SF data collection begins in 2006; mainstem data collection begins in 2008 | \$360,000 | \$300,000 | \$60,000 | Snohomish County, Stillaguamish Tribe | Previously funded work | \$0 | Continue NF data collection and analysis | \$70,000 | Continue NF; continue SF; add mainstem data collection | \$290,000 | 2015 | \$1,000,000 |
| | Reach scale river restoration analysis | Basin wide | Snohomish County | Not started | \$100,000 | \$0 | \$100,000 | Snohomish County | Data acquisition | \$60,000 | Analysis, reporting | \$40,000 | NA | \$0 | 2008 | \$0 |
| | Estuary monitoring and assessment | Estuary | TNC, Stillaguamish Tribe | Ongoing | \$240,000 | \$195,000 | \$45,000 | TNC, Stillaguamish Tribe | Staffing (1.2 FTE) | \$80,000 | Staffing (1.2 FTE) | \$80,000 | Staffing (1.2 FTE) | \$80,000 | Ongoing | |
| | H-Integration modeling | 2 populations | Tulalip Tribes, Stillaguamish Tribe | EDT fully populated for summer and fall pops. SHIRAZ to be accessed and run | \$30,000 | \$30,000 | \$0 | NA | Update existing EDT model; populate and test SHIRAZ model for SF, NF populations | \$30,000 | NA | \$0 | NA | \$0 | Ongoing (every 5 years through 2055) | \$255,000 |
| Strategic Planning | Comprehensive estuary restoration strategy | Program | Snohomish County | Not started | \$50,000 | \$25,000 | \$25,000 | Snohomish County | NA | NA | Develop scope of work | \$5,000 | Research, analysis, outreach, reporting | \$45,000 | 2009 | \$0 |
| | Comprehensive floodplain function strategy | Program | Snohomish County | Not started | \$50,000 | \$25,000 | \$25,000 | Snohomish County, WDFW, Snohomish County, Stillaguamish Tribe | Develop scope of work | \$5,000 | Research, analysis, outreach, reporting | \$45,000 | NA | NA | 2008 | \$0 |
| Watershed Coordination | Lead entity administration | Program | Snohomish County, Stillaguamish Tribe | Ongoing | \$510,000 | \$0 | \$510,000 | Stillaguamish Tribe | Staffing (2.25 FTE) | \$170,000 | Staffing (2.25 FTE) | \$170,000 | Staffing (2.25 FTE) | \$170,000 | Ongoing | |
| | Total non-capital need | | | | \$6,769,600 | \$3,222,000 | \$3,547,600 | | Total cost year 1 | \$2,438,200 | Total cost year 2 | \$2,123,200 | Total cost year 3 | \$2,208,200 | | |