

# SALMON CONSERVATION IN THE SNOQUALMIE WATERSHED



## SNOQUALMIE WATERSHED FORUM STRATEGY AND WORK PLAN 2001

City of Carnation  
City of Duvall  
City of North Bend  
City of Snoqualmie  
King County

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# SALMON CONSERVATION IN THE SNOQUALMIE WATERSHED

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## I. INTRODUCTION

The Snoqualmie Watershed contains some of the healthiest habitat remaining in King County and supports wild populations of coho, chinook, chum and pink salmon, as well as steelhead, cutthroat, rainbow and bull trout. The listings of chinook salmon and bull trout as threatened under the Endangered Species Act (ESA – *for a list of acronyms used in this report, please see Appendix A*) has brought additional focus to the need to conserve habitat for these and other salmonid species. The immediate effect of the proposed listings for local government was the requirement to consult with federal agencies before undertaking projects with federal funding or permits. As of January 8, 2001, local governments, agencies, and individuals can be faced with third party lawsuits and/or prosecution by the National Marine Fisheries Service (NMFS) if they undertake actions that “take” or “harm” chinook salmon.

Salmon conservation efforts will affect everyone in the Puget Sound region, from individual landowners, to local governments, to farmers, to businesses. The development of salmon conservation plans to respond to these listings is taking place at the scale of the Snohomish Basin, also known as Water Resource Inventory Area (WRIA) 7. Snohomish County is the lead entity for preparing a salmon conservation plan. However, with the basin land area equally split between King and Snohomish Counties, King County and the four Snoqualmie Watershed cities have a major role in developing and implementing the conservation plan. Although chinook salmon and bull trout are the species currently listed under ESA, ongoing technical and planning work is being undertaken with the expectation that other species are likely to be listed. Therefore, a multi-species approach is being developed to protect all wild salmonid stocks in the Snohomish River Basin.

Development and implementation of actions to comply with the ESA presents unique challenges for local governments. For larger governments, like King and Snohomish Counties, challenges include determining the cumulative impacts of conservation strategies across widely diverse levels of development and habitat types. For smaller governments with limited technical staff and control over only a small percentage of the basin, a particular challenge is identifying actions for their jurisdictions that are science-based. As a practical matter, smaller governments are hard-pressed to actively participate in ESA discussions going on at the state, regional, and local level. All governments in the Snohomish Basin will face the challenge of finding common ground and making informed decisions that will affect a basin that is larger than some states.

In recognition of the likely efficiencies to be gained through cooperative efforts by local governments to develop science-based conservation strategies, local governments in the Snoqualmie Watershed recently entered into an Interlocal Agreement (ILA) for joint development, review, and participation in watershed conservation plans. This agreement formally establishes the Snoqualmie Watershed Forum. This watershed strategy is intended to provide context on conservation work to date and to lay the foundation for work by the Snoqualmie Watershed Forum and staff members from local governments in the Snoqualmie Watershed.

Specifically, this strategy is intended to:

- Link planning efforts in the Snoqualmie Watershed with guidance in the 4(d) rule, draft State Watershed Planning Guidelines, and proposed Tri-County Guidelines;

- Summarize some of the recent science-based assessments that have been completed or are underway in the Snohomish Basin and Snoqualmie Watershed so that local governments can maximize use of this information and avoid duplication of effort;
- Highlight early actions to conserve salmon habitat;
- Provide a context for cooperative efforts by local governments in the Snoqualmie Watershed to develop local ESA responses that respond to the latest technical information and recommendations from the Snohomish Basin Conservation Planning process; and
- Anticipate upcoming decision-points in the development of a Snohomish Basin Conservation Plan so that the Snoqualmie Watershed Forum can participate more strategically.

Several reports and web sites are referenced in this document. Please see Appendix B for a list of document sources and web sites.

## ESA Listings

### ***Chinook Salmon***

In June of 2000, the NMFS adopted a rule prohibiting the “take” of 14 groups of salmon and steelhead listed as threatened under the ESA. The NMFS adopted the “take” rule under section 4(d) of the ESA. This rule prohibits anyone from taking a listed salmon or steelhead except in cases where the take is associated with a NMFS-approved program. The 4(d) rule approves some specific existing state and local programs and creates a means for NMFS to approve additional programs if they meet certain standards set out in the rule. This rule went into effect on January 8, 2001. With the effective date of the rule, anyone who wishes to file a lawsuit against public or private entities thought to be illegally harming a threatened species or its habitat may do so under the authority of the 4(d) rule.

### ***Bull Trout***

On November 1, 1999, the United States Fish and Wildlife Service (USFWS) announced the listing of bull trout, including the populations around Puget Sound, as threatened under the ESA. In addition, Dolly Varden were proposed for listing as “Threatened” based on the “similarity of appearance” provision under the ESA on January 8, 2001. As of December 1, 1999, it has been illegal to harm bull trout or their habitat. For the purposes of implementing protections of bull trout, USFWS classifies the entire Snohomish Basin as presumed distribution for bull trout.

## The Snoqualmie Watershed

The Snoqualmie Watershed comprises 692 square miles and nearly half of the Snohomish Basin WRIA (see **Figure 1**, next page). Approximately 75% of the Snoqualmie Watershed lies within the Forest Production District and this largely undeveloped headwater area helps to maintain hydrologic functions and protect water quality. Most of the Snoqualmie River Floodplain below Snoqualmie Falls is zoned for low-density agriculture uses. Between 1980 and 1999, the population in the Snoqualmie Watershed nearly doubled, from just under 20,000 to approximately 38,000. The Puget Sound Regional Council predicts that the population in the Snoqualmie Watershed will grow from its current estimated level of approximately 40,000 to over 70,000 residents by 2020.

Figure 1: Snoqualmie Watershed and Snohomish Basin WRIA



## Issues Facing the Snoqualmie Watershed

### *Growth Management Act (GMA) vs. ESA*

Under the GMA, local jurisdictions are required to plan for and accommodate a certain amount of growth within their Urban Growth Boundaries in a twenty-year timeframe. However, local

jurisdictions must also respond to mandates under the ESA and new state requirements for shorelines and stormwater management that may also restrict this growth. An added challenge for Snoqualmie Watershed jurisdictions is the location of growth areas in the floodplain, which could be subject to greater land use restrictions in order to protect habitat. The challenge for local governments is meeting these potentially conflicting federal and state mandates while at the same time carrying out the vision of the community as expressed in local Comprehensive Plans.

### ***Potential Conflicts between Agriculture and Salmon Conservation Efforts***

Low commodity prices, shrinking regional infrastructure for farms, and increased environmental regulations are making it increasingly difficult for farmers in the Snoqualmie Watershed to stay in business. There is a great deal of concern about how proposed habitat management zones and buffers will be applied to agricultural lands. Loss of productive land area translates directly into lost revenue from crops and reduced numbers of livestock that can be kept on a property while meeting manure management requirements. In addition, many of the opportunities for habitat protection and restoration are found on agricultural land in the floodplain of the Snoqualmie River. Agricultural landowners fear that they will need to bear of disproportionate burden of salmon recovery efforts.

### ***High Density Development in Sub-Basins***

While urban areas constitute only about 3% of the total basin area, they make up a significant portion of some sub-basins, including Coal Creek (50%), mainstem Snoqualmie (15%), Patterson Creek (10%), and Cherry Creek (6%). The potential for high density development is increased by the presence of vested lots and plats. This is a particular concern in the Patterson and Ames Creek sub-basins.

### ***Conversion of Forest Land to Residential Uses***

Conversion of land from forest use to residential use is a growing concern in the basin. Changes in the regional economy and the proximity of the Snoqualmie Watershed to employment opportunities on the eastside have increased pressure to sell private holdings of forested land.

### ***Protection of Public Health and Safety***

A major concern of both local and regional governments is the protection of people and property. The Snoqualmie Watershed experiences winter floods that damage homes and property, and local jurisdictions are particularly interested in reducing flood hazards. However, activities such as levee maintenance and emergency repairs are increasingly difficult to carry out under the ESA. Local jurisdictions will need to seek out projects that both reduce flood hazards and improve habitat. Examples include levee setbacks and purchase of repetitively damaged homes.

### ***Limited Tax Base to Support Watershed Projects/Need for Regional Funding***

Having the vast majority of the Snoqualmie Watershed in low-density land use is a double-edged sword in terms of salmon recovery. On the positive side, low-density land uses should help to preserve the relatively health habitat of the Snoqualmie Watershed. On the negative side, the financial capacity of this watershed to support habitat protection and restoration projects on its own will always be limited. If salmon conservation plans point to major protection and restoration

projects in the Snoqualmie Watershed, then a regional funding source will be necessary in order to ensure that the costs of salmon conservation are shared equitably across the region.

### ***Stormwater Issues***

Management of stormwater impacts from new and existing developments is a key part of local efforts to respond to the ESA. Although most jurisdictions in urbanized areas already have long-standing stormwater management programs supported by service charges, these programs are just getting underway for most jurisdictions in the Snoqualmie Watershed. The establishment of new stormwater funding sources is always controversial, and it will take significant work by local governments to develop a package of services and equitable funding mechanisms that the public will support.

### ***Septic Systems and Water Quality***

Many residents in the Snoqualmie Valley use septic systems and also live on or near waterways. This situation could lead to diminished water quality if the septic systems are not well maintained and effluent leaches into waterways or aquifers. This is particularly a concern for smaller tributaries and streams in the Snoqualmie Watershed. To help prevent water contamination from septic systems, homeowners should be encouraged to maintain their systems and learn about potential impacts to their environment. New regulations adopted in 1999 require certification of professionals working on on-site sewage systems, enhanced design standards, and annual inspections to support proper maintenance of these systems. The Snoqualmie Watershed Forum would like to see monitoring of these new requirements for implementation and effectiveness.

### ***Large Scale of Snohomish Basin***

The sheer scale of the Snohomish Basin (two hours driving time between some towns) presents a major challenge in terms of building a sense of shared concern and responsibility for resources in the basin that can serve as the foundation for a Snohomish Basin Salmon Conservation Plan. The large scale also presents an obstacle to effective enforcement of regulations and meaningful public outreach efforts, since both financial and staff resources are limited.



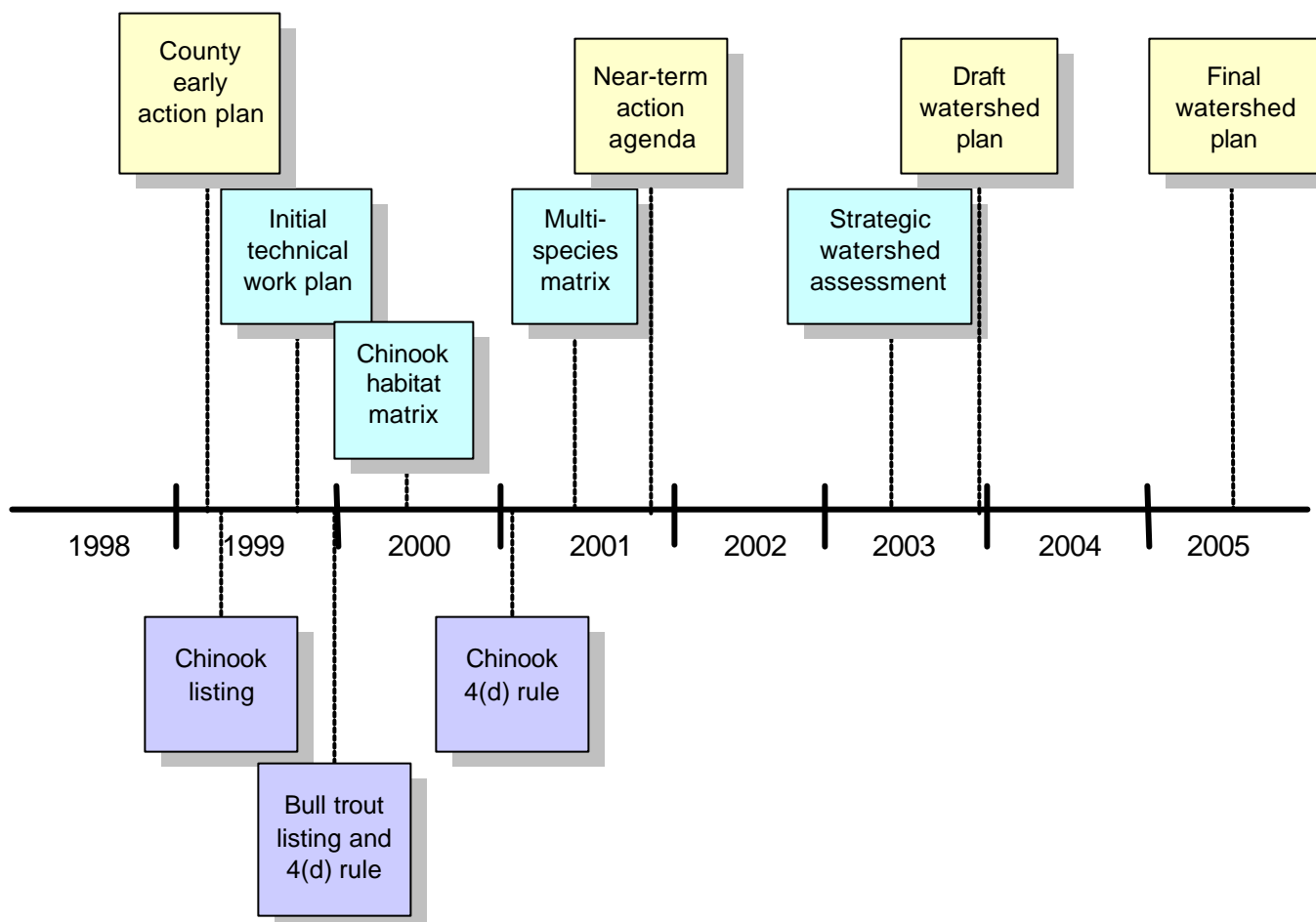
## II. DRIVERS AND GUIDELINES FOR SALMON CONSERVATION PLANNING

Salmon conservation planning work in the Snohomish Basin, and local efforts to comply with the Endangered Species Act are responding to three drivers:

### 1. Tri-County WRIA Planning and Assessment Framework

The Tri-County Salmon Conservation Planning Framework is a collaborative approach to identifying, prioritizing, and implementing near and long- term salmon conservation and recovery actions within watersheds. The fundamental purpose of WRIA planning is to recover species listed under the ESA to sustainable, harvestable population levels and to provide participating entities with a mechanism for regulatory certainty under the ESA. The WRIA Planning Framework has two major elements, a ***Near-Term Action Agenda***, to be completed by December of 2001, and a detailed ***Multi-Species Conservation Plan*** to be completed by June 2005. The timeline for development of a Conservation Plan for the Snohomish Basin is shown below in ***Figure 2***.

Figure 2: Snohomish Basin (WRIA 7) Conservation Plan Timeline  
 Source: Snohomish County Surface Water Management Division



## 2. (4)d Rule for West Coast Salmonids

The NMFS' 4(d) regulations are a major driver for the conservation and recovery work being initiated in WRIA 7. The 4(d) rule's principle function is to prohibit actions that kill or injure (i.e., "take") a threatened species. In addition to prohibiting "take" of listed species, the 4(d) rule also lays out a process for NMFS to establish limits, or exceptions, to the "take" prohibitions for programs or activities that will minimize impacts on threatened species. The 4(d) rule sets out the standards NMFS will use when it reviews programs, and describes how the public will be given notice of the opportunities to review the program being submitted and how the NMFS Northwest Regional Administrator will approve it.

- The 4(d) rule describes thirteen limits. Two of these limits have particular relevance to the ongoing watershed planning process in WRIA 7:
- ***Habitat Restoration Projects***: This limit covers restoration activities that are likely to help conserve listed fish and carried out accordance with a watershed plan that has been certified by the State of Washington.
- ***Municipal, Residential, Commercial, and Industrial Development and Redevelopment (MRCI)***: MRCI limit can be tailored to minimize impacts on listed salmonids to the extent that additional federal protections would not be needed to conserve the listed species.

## 3. Draft State's Watershed Planning Guidelines for Salmon Conservation

As noted above, local governments can seek an exception from the take prohibition for restoration projects that are carried out in accordance a watershed plan certified by the State of Washington. The state is in the process of drafting guidelines for watershed plans. These guidelines can be used voluntarily by local jurisdictions responsible for watershed planning to provide the means for locally developed watershed plans to be recognized by the federal government as species conservation plans that respond to the ESA. A main purpose of these guidelines is to promote consistency in local plans and to clarify what is needed in watershed level plans to conserve healthy habitat and salmon populations.

### III. PROGRESS ON CONSERVATION PLANNING IN WRIA 7

The proposed Tri-County WRIA Planning framework contains ten essential elements that WRIA-based planning efforts would need to include in order to qualify for a limit on take from the 4(d) rule. These essential elements are:

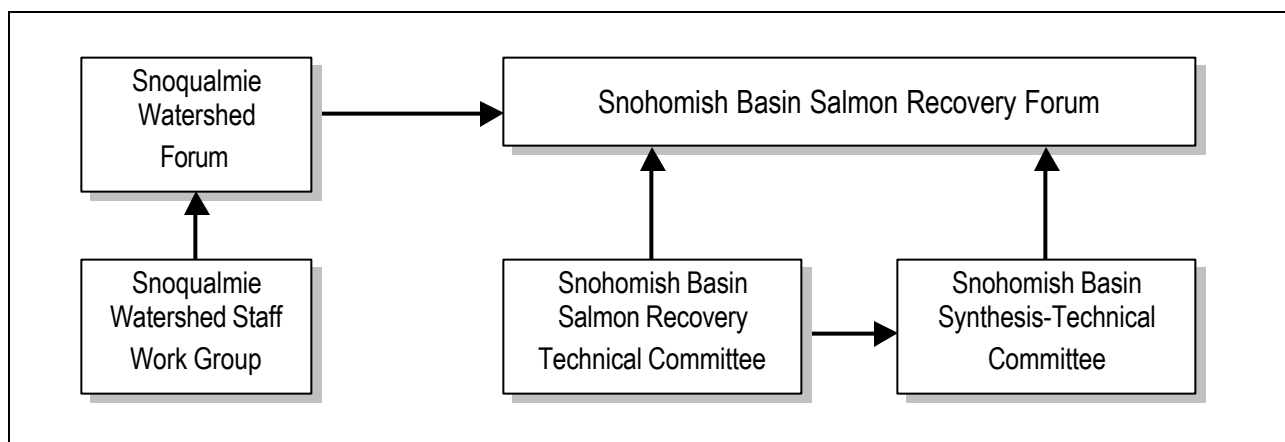
- |   |                                    |
|---|------------------------------------|
| 1. Watershed Coordination                                     | 5. Action Alternatives             |
| 2. Certainty of Plan Development, Funding, and Implementation | 6. Salmon Conservation Plans       |
| 3. Science-Based Watershed Assessment                         | 7. Plan Approval and Adoption      |
| 4. Watershed-Based Goals                                      | 8. Public Outreach and Involvement |
|   | 9. Monitoring                      |
|   | 10. Adaptive Management            |

The elements that are most relevant in setting a context for work in the Snoqualmie Watershed during the next two years are watershed coordination, certainty of plan development, funding, and implementation, watershed-based goals, science-based watershed assessment, action alternatives, salmon conservation plans, and public outreach and involvement. Plan approval and adoption, monitoring, and adaptive management are elements that will be addressed as the basin plans are nearer to completion.

#### Watershed Coordination

In order to address the extensive ramifications of the salmon listing issue, several Forums and Committees have been convened in the Snohomish Basin to ensure a cohesive, effective approach that considers both geographic and technical elements (*See Figure 3*).

Figure 3: Coordination of Salmon Conservation Planning Efforts in the Snohomish Basin



The **Snohomish Basin Salmon Recovery Forum** (Recovery Forum) is a group of elected officials and stakeholder representatives drawn from the Snohomish River Basin (including the Skykomish and Snoqualmie River Watersheds) to address salmon recovery and watershed issues. It is the overall coordinating body that oversees that planning and implementation efforts being developed throughout the basin in response to the chinook listing. Every city in the basin has a seat on this Forum if they desire to participate.

The **Snoqualmie Watershed Forum** is comprised of local elected officials and citizens from throughout the watershed to address local and regional habitat, water quality, and flood concerns. This Forum was recently formalized via an interlocal agreement and will continue to inform the basin level conservation process. Currently, six members of the Snoqualmie Watershed Forum, including representatives from the King County Council, the four Snoqualmie Valley cities, and a citizen representative of the King County agricultural community, are voting members of the Recovery Forum. It is expected that Snoqualmie Watershed Forum members will review and make recommendations for the Near-Term Action Agenda and will participate in the development of Snohomish Basin conservation goals in the coming year.

The **Snohomish Basin Salmon Recovery Technical Committee** (Technical Committee) is composed of approximately thirty representatives of governmental and nongovernmental organizations. Co-chaired by King County and Snohomish County, the committee also includes staff members from the City of Seattle, the City of Everett, the Port of Everett, the co-managers of salmonid fisheries (Washington Department of Fish and Wildlife and the Tulalip Tribes), Washington State Department of Ecology, Washington State Conservation Commission, the Stilly-Snohomish Fisheries Enhancement Task Force, Washington Trout, U.S. Environmental Protection Agency, U.S. Forest Service, and National Marine Fisheries Service.

The **Synthesis-Technical Committee** is a mixture of Technical Committee members and policy staff members for entities represented on the Snohomish Basin Forum. The overall charge of the Synthesis-Technical Committee is to coordinate the development of the multi-species salmonid conservation and recovery plan, the Near-Term Action Agenda, and other efforts for the Recovery Forum.

The **Snoqualmie Watershed Staff Group** is comprised of staff members from King County and the Cities of Duvall, Carnation, Snoqualmie, and North Bend who are involved in developing local ESA response strategies. This staff group meets monthly. In 2001 it will focus on developing a coordinated approach to reviewing and updating local regulations and policies in accordance with the ESA and recommendations coming out of the Snohomish Basin Salmon Conservation Planning process.

Coordination among these groups is of paramount importance to ensure that the final Conservation Plan reflects the unique characteristics and requirements of the watershed.

### ***Policy Integration and Coordination***

In addition to the technical coordination achieved through the Forums and Committees, integration of local and regional planning policies is critical to ensure that jurisdictions are implementing complementary directives. Local jurisdictions have been working together to develop ESA-

compliant land use management and best management practices (BMPs) as part of the Tri-County Model 4(d) Proposal process. Watershed Planning is a core element of this model proposal. Other elements include:

- **Road Maintenance Practices:** This proposal establishes a set of BMPs to protect salmon habitat while performing road maintenance activities that local jurisdictions could adopt and implement in order to qualify for a “take” limit under the ESA Section 4(d) rule for threatened salmonids. This plank of the Tri-County Model 4(d) Proposal is closest to completion. The current Tri-County proposal has been submitted NMFS for review and approval of a “take limit” for roads work that is carried out in accordance with these proposed practices.
- **Land Management:** This proposal establishes a Management Zone in and along most water bodies and is intended to preserve essential biological functions for salmon.
- **Stormwater Management:** This proposal is intended to better protect and restore salmon habitat from the impacts of existing and future development. The proposal includes requirements for future facilities planning, public education, improved facility maintenance, and habitat acquisition and restoration.
- **Adaptive Management:** This proposal provides a long-term commitment to monitor outcomes, evaluate successes and failures, and recommend needed course corrections in local efforts to comply with ESA.
- **Habitat Funding Program:** This program seeks to develop a regional funding strategy that all jurisdictions might participate in and which will advance the recovery of salmon within the Tri-County region and within the watersheds of the Tri-County area. It will also define local responsibilities that, if satisfactorily completed, would fulfill capital funding requirements for the application of the Municipal, Residential, Commercial, and Industrial (MRCI) “take” limitation to jurisdictions within the Tri-County region, and any equivalent limit in the final 4(d) rule for bull trout.

Once these elements are approved by NMFS, local governments have several options:

- Adopt an element(s) “as is” to obtain a “take” limit from NMFS;
- Propose modifications to an element(s) with justification and seek a “take” limit; or
- Use the element(s) as a guide to improve existing regulations and programs but decide not seek a formal “take” limit.

Tri-County jurisdictions are currently completing a formal Biological Review of the model programs that are scheduled to be completed in mid-2001. The model programs will then be submitted to NMFS for a determination regarding their adequacy for protecting salmon under the ESA.

## **Certainty of Plan Development, Funding, and Implementation**

King County and the Cities of Carnation, Duvall, North Bend, and Snoqualmie recently entered into an ILA to clarify the roles and responsibilities of local jurisdictions in the development of WRIA-based salmon conservation plans and make a commitment to watershed planning. The agreement also provides a mechanism for the implementation of habitat, water quality, and flood projects with other regional, state, federal, and nonprofit funds as they become available. The five-year duration

of the agreement and its cost-sharing component provide a much greater degree of certainty that local governments in the Snoqualmie Watershed will participate actively in the development of a salmon conservation plan for the Snohomish Basin. There is the potential for a Snohomish Basinwide agreement to be executed in the future. This Snoqualmie Watershed ILA notes this potential and is intended to be compatible with a Snohomish Basinwide agreement.

## **Watershed-Based Goals**

### ***NMFS' Fish Population Goals***

In 2000, NMFS convened the Puget Sound Technical Recovery Team (TRT) to develop recovery and delisting goals for Puget Sound chinook and other salmon stocks listed as threatened under the ESA. Chaired by NMFS, other participants on the TRT include the fisheries co-managers and other regional and statewide salmon ecology experts from the U.S. Forest Service (USFS), the Washington State Department of Natural Resources, and the King County Department of Natural Resources. The mission of the TRT is to develop population-specific goals for abundance, productivity, and diversity that will lead to a viable evolutionary significant unit for Puget Sound chinook salmon and the other stocks currently listed as threatened. The population-specific goals will form the basis for a recovery plan that will clearly describe the necessary elements for delisting each threatened species. The estimated time frame for finalization of these recovery goals and development of the delisting goals for Puget Sound chinook is the end of 2001. In the meantime, State Fish and Wildlife and the Northwest Indian Fisheries Commission are expected to release interim salmon abundance, productivity, and diversity goals, including harvest and escapement goals, in February 2001.

### ***Population Goals for Bull Trout***

USFWS has established a "Recovery Unit Team" to establish population goals for bull trout.

### ***Snohomish Basin Interim Goals***

In the absence of federal and state population goals, salmon conservation planning work in the Snohomish Basin is being guided by two goals, as stated in the Initial Snohomish River Basin Chinook Salmon Conservation/Recovery Technical Work Plan (Initial Chinook Work Plan):

- Initial Goal: "Develop a technical work plan to protect, restore and enhance the productivity and diversity of wild chinook salmon stocks in the Snohomish River watershed to a level that will sustain fisheries as well as nonconsumptive salmon-related cultural and ecological values."
- Longer-Term Goal: "Develop a multi-species salmonid recovery plan during a five-year time period to protect, restore and enhance the productivity and diversity of all wild salmonid stocks in the Snohomish River watershed to a level that will sustain fisheries as well as nonconsumptive salmon-related cultural and ecological values."

While work on the Snohomish Basin Conservation Plan moves forward, the Technical Committee is staying abreast of goal-setting work by the TRT, the Washington State Department of Fish and Wildlife (WDFW), and Tulalip Tribes so that the committee can anticipate likely goals.

### ***Harvest and Hatchery Goals***

Statewide, salmonid species and other fish species are co-managed by WDFW and Native American Tribes. For WRIA 7, the specific co-managers of fisheries resources are WDFW and the Tulalip Tribes. Both WDFW and Tulalip Tribes are represented on the Technical Committee. The co-managers are recommending harvest and hatchery programs that are consistent with the overall harvest management goal developed by the Technical Committee for WRIA 7. This goal is to manage chinook salmon harvest to provide a high probability of allowing all natural stocks in WRIA 7 to rebuild to levels that will support directed harvest and other benefits. Numerical goals will be established once the data is available to support them.

Chinook salmon in the Snoqualmie Watershed and throughout WRIA 7 are managed primarily for natural production (fish production that is sustained by natural spawning and rearing in natural habitat). The co-managers will review existing artificial production programs in WRIA 7 to identify aspects of those programs that could be modified to reduce risks to the natural stocks of chinook salmon. Any newly proposed artificial production projects will be evaluated for risk to wild chinook salmon stocks and approved only if the risk will be minimal.

The only chinook salmon hatchery in WRIA 7 is the Wallace River hatchery, located at the confluence of Wallace River and May Creek near the town of Startup in Snohomish County. The Tulalip Tribes operate a hatchery in Tulalip Bay. The operations and impacts of these hatcheries will be monitored by the co-managers to ensure that the programs are consistent with the recovery of wild chinook stocks.

### **Science-Based Watershed Assessment**

Science-based watershed assessment is a technical effort that describes the evaluation of ecological processes in a watershed, salmon habitat conditions, impacts of human activity, and where and what needs to be done to return a watershed to a productive state for salmon. To date, two major efforts and several smaller strategic endeavors have been undertaken in WRIA 7 to augment the technical understanding of the Snoqualmie Watershed and the processes that support salmon and their habitat.

#### ***1. Snohomish Fish Distribution Maps***

In 1995, the Snohomish River Basin Work Group published fish distribution maps for wild chinook, coho, chum, and pink salmon, and steelhead trout throughout the Snohomish Basin. The maps used existing data and the collective knowledge of those most familiar with the species and their habitat to show the distribution of primary spawning areas, summer and winter rearing for juveniles, and adult holding pools. However, data on juvenile salmonid use of the Snoqualmie River system is particularly deficient. To fill this data gap, King County is currently planning to undertake fish presence surveys for the mainstem Snoqualmie later this year. These surveys will provide a more complete picture of juvenile salmonid use in the mainstem and also verify the accuracy of and update the existing maps.

## 2. **Initial Chinook Work Plan**

The *Initial Chinook Work Plan* was published by the Technical Committee in October 1999 to provide a technical basis for chinook salmon conservation and recovery for the Snohomish Basin. The work plan summarizes existing information about WRIA 7 and presents an overview of general basin conditions. Factors addressed are chinook salmon habitat requirements, habitat-forming processes, status of the population, factors affecting the population, and data gaps. The most significant habitat problems identified in the *Initial Chinook Work Plan* include:

- Loss of channel area and complexity due to bank protection and diking of the river and major tributaries, cutting off the channel from its floodplain.
- Dearth of in-channel large woody debris.
- Flood flows that scour redds at high frequencies.
- Increased sediment input to streams as a result of slope failures.
- Poor quality riparian forests.
- Loss of wetlands due to draining for land conversion that eliminates habitat and reduces water retention.
- In-redd mortality due to siltation or water quality contamination.
- Urbanization (road construction, commercial and residential construction, additional bank hardening) that further reduces chinook salmon viability in the basin.
- Artificial barriers (dams, tide gates, diversions, culverts, pump stations) that prevent juveniles from reaching rearing habitat.

The work plan also recommends initial harvest management, artificial production, and habitat management actions to conserve and recover chinook salmon in WRIA 7.

## 3. **Data Gaps**

Important habitat data gaps were identified in the *Initial Chinook Work Plan* that was crafted by the Technical Committee. In order for an accurate and complete strategic approach to salmon conservation and planning for the Snohomish Basin to be executed, these gaps must be addressed. Current data gaps and the actions necessary to fill them are listed below:

- Assess and update maps of existing flood control facilities.
- Document current abundance and function of in-channel large woody debris (LWD). LWD refers to large logs and rootwads in or on the banks of rivers that fish use to hide and rear.
- Identify opportunities for accelerated riparian forest recovery.
- Evaluate potential for LWD recruitment on a basinwide scale.
- Evaluate riparian conditions in agricultural areas to determine their relationship to increased bank erosion.
- Identify areas that are particularly susceptible to land disturbances, bank erosion, and slope failures.



- Gather more detailed knowledge of historic conditions.

#### **4. *Inventory and Assessment of the Lower Mainstem Snoqualmie River and Valley Floor***

Prior to 2000, a habitat conditions inventory of the mainstem Snoqualmie River did not exist. To begin to fill the data gaps noted above, King County Water and Land Resources Division (WLRD) and Washington Trout are compiling and evaluating data on riverbank, riparian vegetation, and fish habitat conditions in the Snoqualmie Watershed. The data is being collected in the mainstem Snoqualmie, Tolt, and Raging Rivers as well as in some of the smaller tributaries to the Snoqualmie River. This two-phase project began last summer and will continue into early 2002.

The purpose of the inventory is to determine where there is relatively healthy salmonid habitat (as defined by ecological criteria) that could be protected and where there is degraded salmonid habitat that could be restored. Other issues that will be addressed are floodplain and side channel/oxbow connectivity, summer (low flow) habitat conditions in the Snoqualmie River mainstem, and targeted restoration of ecosystem processes and degraded habitat. Attributes of healthy habitat include unaltered riverbank, an abundance of LWD, and healthy riparian vegetation with mature trees and native shrubs that provide shade and nutrients.

The first phase of this project included an inventory of bank conditions (rip-rap, unaltered bank, erosion, human and cattle access points, and dumping and discharge points), riparian vegetation (maturity, nativity, and density of trees and shrubs) and LWD. This inventory was undertaken along both banks of 40 miles of the mainstem Snoqualmie River from Snoqualmie Falls to the King-Snohomish County line and along both banks of 3 miles of the lower Tolt River. Field staff members also mapped floodplain and river channel modifications such as culverts, the mouths of tributaries and back channels, and piling. These features were mapped in the field in August—September 2000, using Global Positioning System (GPS) satellite equipment.

Temperature measurement was an additional component of the habitat inventory to determine if pools in the mainstem Snoqualmie are sufficiently cool to provide good holding and rearing habitat for salmonids. On July 14, 2000, temperature loggers were installed in five pools throughout the mainstem of the river. The loggers recorded temperature continuously from that date until they were removed from the river on September 30, 2000. This data has been graphed and will be compared to Washington State water quality standards for temperature to assess the quality of the habitat provided by the pools.

The second phase of the habitat conditions inventory will occur in summer, 2001 and will focus on in-stream features that relate to salmonid habitat (e.g., riffles and pools, channel substrate, spawning gravel, and fish access to off-channel habitat) in the mainstem Snoqualmie. King County will also assess in-stream and riparian habitat conditions in tributaries that have limited data at present.

The summer 2001 field work will also include completing the habitat inventory on the lower six miles of the Tolt River mainstem for the riparian features that were inventoried on the Snoqualmie River mainstem in summer 2000 (i.e., hydromodifications, riparian vegetation, LWD, and access

points). A similar habitat conditions inventory will be conducted on the Raging River mainstem for riparian features.

Summer 2001 field data will be imported to Geographic Information Systems (GIS) map layers in the fall of 2001 and early 2002. The maps will be overlain on aerial photos of the Snoqualmie River and the valley floor that were taken in fall 2000.

The new baseline data from both phases of the inventory will help King County and its regional partners in the Snoqualmie Watershed Forum to identify and prioritize protection and restoration actions in the Snoqualmie River mainstem and valley floor, including opportunities to reconnect the mainstem Snoqualmie with its floodplain. Some of the actions could be included in the Snohomish Basin Near-Term Action Agenda that will be developed in the first half of 2001. Other actions will be longer-term and therefore included in the multi-species salmonid conservation and recovery plan for WRIA 7. The habitat conditions inventory data will also provide a point of reference for monitoring the effectiveness of actions that are taken and for adaptive management in the future.

Due to funding constraints, the Phase I and Phase II habitat inventories have not included wetlands. The Washington State Department of Ecology (WDOE) is in the process of analyzing existing wetland data and visiting wetland sites in the mainstem Snoqualmie River, Tolt River, and Raging River basins in order to assess wetland functions and to determine where degraded wetlands can be restored. King County WLRD will coordinate with WDOE staff members who are performing the Snohomish Basin Wetland Restoration Effort to obtain recommendations of potential wetland restoration sites in these basins. This information is expected to be available by June 30, 2001.

### **5. *Aerial Photos to Classify Land Cover***

In 2000, King County contracted to have aerial and satellite images taken of the entire county to facilitate growth management and natural resource planning. Aerial images were taken from Puget Sound to east to a line running north-south, approximating the boundary between Ranges O7E and O8E (just east of Lake Joy). Aerial images were also taken of the Snoqualmie and North Bend areas, extending east to approximately Exit 31 on Interstate 90. These images are of high quality and replace the last set taken in 1996. The portion of King County east of these areas was photographed with a satellite. The aerial images were taken at a resolution of 1 pixel to 2.7 square feet (1.6 feet on a side). By contrast, the satellite images are at a resolution of 1 pixel to 172 square feet (13.1 feet on a side).

The aerial images are already being used in the upcoming Near-Term Action Agenda to identify priority areas for protection and/or restoration. In addition, King County is contracting for services to classify land cover into several basic categories, including impervious surface, grassland, tree cover, shrubs, open water, and others. This will assist with watershed assessments for both salmon conservation and drainage CIP identification by showing the level of alteration to natural hydrologic regimes for this area. Results of this land classification should be available by June 2001 and will be followed by additional, more detailed analyses of smaller portions of the county.

## **6. Reconstruction of Historical Habitat Project in Conjunction with the University of Washington (UW)**

Another data gap identified in the *Initial Chinook Work Plan* is information on historic habitat conditions that can be used to inform analyses of potential habitat productivity and to identify potential habitat restoration projects. King County WLRD and UW Department of Geological Sciences are working together to obtain a comprehensive picture of historical (pre- and post-settlement) chinook, bull trout, and other salmonid physical habitat conditions in the Snoqualmie River mainstem and valley floor, downstream of Snoqualmie Falls to the King County line. UW scientists are reviewing historical maps (1871-1873, 1900), aerial photos (1930s and 2000), General Land Office survey field notes, and other historical materials about the Snoqualmie River mainstem and valley floor and conducting field checks of present conditions. The UW team will construct GIS map layers of historic channels, wetlands, and forest tree cover. The maps will be used to consider the sizes and species of historic floodplain trees as an indicator of the size and type of woody debris that would enter the Snoqualmie River and to analyze trends through time in the elevation of the riverbed. This information will then be applied to the identification and prioritization of habitat protection and restoration actions, including reconnecting the main channel and side channels/oxbows or reconnecting the Snoqualmie mainstem and its floodplain. This analysis of historic habitat conditions began in the fall of 2000 and will be completed during the first half of 2001.

## **7. Chinook Salmon Habitat Evaluation Matrix**

As a follow-up to the *Initial Chinook Work Plan*, the Technical Committee developed a habitat evaluation matrix for chinook salmon that assesses seven habitat conditions at a sub-basin scale. Based on a review of existing information, the sub-basins receive a “call” of properly functioning, at risk, or not properly functioning for each of the habitat conditions. This matrix is intended to flag areas of concern. It is not a complete and thorough analysis of all causes and effects that limit suitability of aquatic habitats for the natural production of chinook salmon in WRIA 7. Adaptive management will be applied to the matrix, which means that as more information becomes available about habitat conditions in WRIA 7, some of the initial conclusions in some sub-basins will change. Such changes should indicate which management actions lead towards improvement, and which ones need to be modified to prevent further decline in habitat quality and quantity.

## **8. Bull Trout Surveys**

Bull trout prefer clean, cold water with abundant, clean spawning gravel and good rearing habitat cover (clean cobbles and boulders, abundant LWD). Some bull trout are anadromous (i.e., hatch in freshwater, mature in saltwater, and return to freshwater to spawn, while others are freshwater resident fish, spending their entire lives in rivers, streams or lakes). Therefore, unlike chinook salmon, populations of bull trout have the potential to be present above Snoqualmie Falls. However, based on personal knowledge, several members of the Snoqualmie Watershed Forum question whether bull trout are in fact present upstream of the Falls.

For purposes of implementing the ESA, the USFWS classifies all of WRIA 7 as presumed habitat for bull trout. These means that all actions undertaken in the Snohomish Basin that require either a federal permit or federal funding are subject to the requirement of a Section 7 consultation to ensure that they are not likely to jeopardize the continued existence of listed species or adversely impact

their critical habitat. The WDFW rates Snohomish Basin native char population (which include both bull trout and Dolly Varden, a closely related species that is difficult to distinguish) in the Snohomish Basin as healthy, based on populations monitored in the Skykomish Basin.

There are documented sightings of native char in WRIA 7. No comprehensive surveys of bull trout have been undertaken to date within the King County portion of WRIA 7. At the time of this printing, the regulatory requirement to conduct biological assessment and consultations in all areas of the Snohomish Basin, coupled with the lack of detailed information to determine presence or absence above Snoqualmie Falls, has made it more difficult to identify specific steps to protect this listed species.

As a step to addressing this lack of information and the resultant regulatory uncertainty, King County contracted with R2 Consultants to gather existing information on bull trout in King County and to recommend a sampling protocol to fill gaps in existing data. The report (Literature Review and Recommended Sampling Protocol for Bull Trout in King County, R2 Consultants) summarizes the life history of bull trout and estimates their distribution within King County. Based on their findings, R2 Consultants proposed a systematic and formal sampling program to determine the range and extent of native char in King County.

The areas of the Snoqualmie Watershed that were selected for the first phase of the bull trout sampling program included the North, Middle, and South Forks of the Snoqualmie River. In fall 2000, King County WLRD partnered with the USFS and UW to perform electrofishing and snorkel surveys on the North, Middle, and South Forks. Thermographs have been installed at several locations in the upper North, Middle, and South Forks of the Snoqualmie River to determine if water temperature is suitable for bull trout, especially for egg incubation. The temperature data will be downloaded in spring, 2001.

A second phase of the bull trout sampling program has been proposed, but funding and partnership issues need resolution. During the second phase, sampling has been recommended to be conducted in those areas where native char were not found during the Phase 1 sampling program but which contain habitat conditions considered being suitable for bull trout spawning and rearing, based in part on the thermograph data. For the Snoqualmie Watershed, this includes the North Fork and South Fork of the Tolt River, the upper Raging River, and possibly another look at the Snoqualmie River Forks (nighttime snorkeling on the South Fork and Denny Creek). The number of reaches to be sampled should be determined using the sampling protocols that are currently being developed by the USFWS and the American Fisheries Society. In the event that native char are found in a test area, fin clips should be obtained for genetics testing in order to determine if the fish are bull trout or Dolly Varden.

In January of 2000, biologists from the USFS and WDFW reported native char near the mouths of the Tolt and Raging Rivers and in the mainstem Snoqualmie River between these rivers. If additional funding is committed for sampling, further sampling according to established protocols in these areas should be considered.

## **9. Habitat Assessments by Snoqualmie Watershed Cities**

### *City of Duvall*

The City of Duvall received grant funding from the King Conservation District (KCD) to support an inventory of habitat conditions in streams within its jurisdictional boundaries. This habitat inventory information will be mapped on GIS, and used to improve the application of local sensitive areas regulations and to identify potential habitat restoration projects.

### *City of North Bend*

In 1991, the City of North Bend retained Sheldon & Associates to identify and map wetlands within the City using aerial photographs and soil type maps. The wetland maps have been digitized and updated to reflect developments to date, and are available from the North Bend GIS system. In addition, in 1995, the City adopted their Comprehensive Plan containing map inventories of flood hazards, wetlands, and geological hazards. The City of North Bend also completed a habitat assessment for a portion of Ribary Creek as part of a sedimentation pond project in 1997. In 1998, King County adopted the East King County Groundwater Management Plan characterizing groundwater resource and aquifer recharge areas in the North Bend area, and in 1999 the Cities of North Bend and Snoqualmie adopted the Master Site Plan for their jointly owned 460 acre Meadowbrook Farm property. The Master Plan includes identification of the soil types, wetlands, riparian corridors, plant, and animal habitats on the site. Also in 1999, the City hired Sheldon & Associates to prepare an assessment of the natural and beneficial functions of the floodplain on the City of North Bend's portion of the Meadowbrook Farm (approximately half the site).

In 2000 and 2001, the City is preparing limited city-wide habitat assessments of their stream, wetlands and riparian corridors as part of the Stormwater Management and Flood Hazard Reduction Plans. The City has sensitive area studies documenting stream and wetland habitat resources from a variety of private developments including the 229 acre Tollgate Farm site (2000), the Wyrsh I-90 property (2001), the Forester Woods Multi-Family Site (1997), and the Snoqualmie Plat / 10th Street wetland complex (1996).

The City still needs a comprehensive integrated habitat assessment document supported with additional field research as necessary to provide a complete picture of the habitat in North Bend.

### *City of Snoqualmie*

In 1991, the City of Snoqualmie created a citywide habitat inventory that identified the types and approximate locations of wetlands, streams, and hydric soils based on aerial photos and National Wetland Inventory maps. In addition, a Shoreline Master Program inventory was conducted in March of 1999 that describes wetlands, streams, and general shoreline conditions within the Shoreline Master Program jurisdiction (100-year floodplain). The City also obtained habitat information through a number of project Environmental Impact Statements, including those completed for the Snoqualmie Falls Hydroelectric Project, the Snoqualmie Ridge Mixed Use development and the Falls Crossing Mixed Use development. Other sources of habitat data include environmental assessments conducted for the Corps of Engineers Section 205 Flood Damage Reduction Project and the Meadowbrook Habitat Restoration and Riverbank Biostabilization Project, and Master Plans prepared for the Meadowbrook Farm Preservation Area and the Three Forks Natural Area. Habitat information will be mapped on the City's GIS program, currently under development.

### **10. Approach for Multi-Species Habitat Matrix**

While the initial focus of immediate conservation and recovery actions is on chinook salmon, it is necessary to develop work products and approaches that can be applied to other species as they are listed under the ESA. To this end, the Technical Committee is currently developing a matrix to evaluate habitat conditions for all species of native salmon, trout, and char found in WRIA 7. The Technical Committee reviewed the science-based recovery goals and performance criteria that were used in the chinook matrix and revised them for application to multiple species of salmonids and to nearshore/estuarine areas. This framework links the recovery goals at the sub-basin scale with a suite of habitat condition indicators that are known to be essential for recovery of native salmonids. Other revisions were needed to take into account the different habitat requirements for bull trout. In some instances, these criteria reflect the cumulative effects of watershed processes that have shaped the in-stream and riparian habitat conditions we see today.

Information in the multi-species matrix will be applied to the identification and prioritization of target areas (sub-basins or parts of sub-basins) for near-term habitat protection and restoration actions and in developing the longer-term salmonid conservation and recovery plan for WRIA 7. Development of the multi-species matrix will proceed simultaneously with development of the Near-Term Action Agenda for WRIA 7. The Technical Committee expects to complete the multi-species matrix in the summer of 2001 and to present the matrix to the Recovery Forum in the fall.

### **Action Alternatives**

In 2000, the Recovery Forum and the Snoqualmie Watershed Forum reviewed the *Initial Chinook Work Plan*, which identified nine high priority habitat problems facing chinook salmon in the Snohomish Basin. Snoqualmie Watershed Forum staff members reviewed all of these recommendations, and prepared a letter to the Recovery Forum outlining the likely impacts and issues associated with implementing these recommendations in the Snoqualmie Watershed. The Recovery Forum has since reviewed all of the *Initial Chinook Work Plan* recommendations and noted where they agree with the recommendations and where they want further clarification. For example, the *Initial Chinook Work Plan* called for a prohibition on all further bank armoring in the Snohomish Basin. The Recovery Forum asked for an alternative that would strictly limit all bank armoring, but still allow for narrowly defined exceptions, including protection of an existing sewage treatment plant. The Synthesis-Technical Committee is now working to develop proposed basinwide “guidance” for local governments to use in updating local policies and regulations based on technical recommendations in the *Initial Chinook Work Plan*.

### **Salmon Conservation Plan**

The Near-Term Action Agenda (NTAA) is the primary work focus for the WRIA 7 planning process for 2001. This document will provide recommended principles and actions to stem the decline of salmon during the next two to five years while a longer term salmon conservation plan is being developed. The NTAA is based on the work of the Technical Committee as outlined in their *Initial Chinook Work Plan* and the *Snohomish River Basin Chinook Salmon Habitat Evaluation Matrix*. The NTAA is intended to fulfill both the short-term requirements of the Tri-County WRIA Planning Guidelines as well as the watershed planning guidelines issued by the state for implementing habitat

restoration projects. It is intended to meet the test of Best Available Science and will also inform the longer-term basin-level Conservation Plan.

The NTAA will include the following elements:

- Principles/Guidance for local regulations and policies;
- Strategy and areas of focus for protection and restoration actions;
- Specific habitat and restoration project recommendations;
- Education and outreach;
- Research program;
- Monitoring and Adaptive Management;
- Funding for protection and restoration; and
- Issues for multi-species plan.

The principles and guidance section of the document will provide guidance to local jurisdictions as they update their land use regulations and growth management policies during the next two to five years. These principles are based on the habitat recommendations of the Technical Committee and provide guidance on a range of topics, including implementing bank stabilization projects, managing land uses in channel migration hazard areas, protecting wetlands, and replacing fish passage blockages.

The priority salmon habitat projects section is based on the work of Technical Committee representatives to identify core areas of salmon habitat within the basin and to prioritize protection (acquisition, easements, etc.) and restoration projects within those areas. In addition to prioritizing basinwide habitat capital expenditures during the next two to five years, this section is being developed to respond directly to requests from the Washington State Salmon Recovery Funding (SRF) Board to develop a more coherent strategy for identifying and prioritizing salmon habitat projects. This strategy will include habitat protection principles regarding preferences for certain types of areas (e.g., particularly biologically productive areas), a systematic method for identifying biologically important areas, and a list of research needs and data gaps to improve scientific knowledge about the basin.

## **Public Outreach and Involvement**

Salmon conservation and recovery will require hard decisions about modifying local land use regulations and investing public funds for projects. It will also touch day-to-day decisions about landscaping, water use, and transportation. For local elected officials, it will be particularly challenging to explain their decisions in the context of a watershed as large as the Snohomish Basin. In order to have a conservation plan that can actually be adopted and implemented, education and involvement of both decision-makers and the general public is essential.

### ***Snohomish Basin Outreach***

The Snohomish Basin Public Outreach Committee, which includes representatives from King and Snohomish Counties, Tulalip Tribe, City of Seattle, City of Everett, and other interested parties, meets monthly to coordinate a comprehensive approach to public outreach and involvement. The following tools are now being used to increase public understanding of salmon conservation issues in the Snohomish Basin:

- **Quarterly Newsletter** - The Public Outreach Committee collaborates to produce a quarterly newsletter that highlights ESA-related issues and activities and is mailed to interested residents throughout the basin.
- **Overflights of the Snohomish Basin** - Three flights of stakeholders were conducted over the Snohomish/Snoqualmie watershed to provide participants with a chance to see “the big picture” of landscape, land uses, and the waters that tie them all together, as well as to provide an opportunity to encourage dialogue among the various stakeholders. The flights were funded by the Pacific States Marine Fisheries Commission in conjunction with Lighthawk. Additional flights are planned for later this year.
- **Watershed Tours** - Members of the Recovery Forum toured engineered logjams to learn about the benefits of these structures to fish and humans. Upcoming tours will include examples of habitat restoration and levee setback issues in the Snoqualmie Watershed.
- **Basin Public Meetings** - Several basinwide public meetings were held last year to keep the public updated on the ESA process and its potential impacts and to present grant funding opportunities. The Public Outreach Committee will continue to hold basin public meetings to keep the general public informed and solicit feedback at strategic points during the ESA process.

### ***Snoqualmie Watershed Outreach***

Public outreach and involvement efforts in the Snoqualmie Watershed are more focused on particular issues of interest to Snoqualmie residents.

- **Targeted Workshops:** Workshops on floods and floodplains, agriculture and the ESA, and the Forest & Fish Plan were held at various locations throughout the Snoqualmie Valley to inform the public about specific issues that are impacted by the Chinook listing under the ESA.
- **Hands-On Volunteer Opportunities:** Approximately 400 volunteers planted more than 5,000 native trees and shrubs along streams at seven planting events. The sites were chosen to build on past actions that began revegetating several high resource basins in the Snoqualmie Watershed to create continuous riparian corridors.
- **Snoqualmie Watershed Festival:** The extremely successful second annual Snoqualmie Watershed Festival was held on October 16, 1999 at Tolt-MacDonald Park in Carnation. Hundreds of children and adults enjoyed restoration project tours, planting trees, making fish-prints and bird houses, listening to bands, and eating at the salmon bake provided by the Snoqualmie Tribe. The Festival was promoted in conjunction with a watershed poster contest that involved all the schools in the Snoqualmie Watershed. Community groups in the Snoqualmie Watershed organized the festival with assistance from King County and funding from the King Conservation District.



- **Small Change for A Big Difference in the Snoqualmie Grant Program:** With funding support from the King Conservation District, competitive grants were offered for Snoqualmie Watershed projects that supported salmon and watershed education, enhancement, protection and restoration efforts. Three community based organizations were awarded grants to expand and improve watershed education efforts at Stillwater Elementary School, remove junked car bodies and large items from the Snoqualmie River and adjacent riparian areas, and to monitor Lynch and Crazy Creeks for salmonid use and a restoration planting success rate.
- **Cooperative Work with Local Jurisdictions:** As result of the ILA, King County staff members can also support some salmon conservation-related public outreach efforts with cities. For example, staff members are working with the City of Snoqualmie to coordinate educational workshops on maintenance of septic systems near Kimball Creek.
- **Snoqualmie Web Page:** King County staff members created a web page that is focused on the Snoqualmie Watershed and issues such as agriculture, flooding, and forestry that are particularly relevant to this area. It also contains links to the cities in the Snoqualmie Valley. The web page can be found at <http://splash.metrokc.gov/wlr/watersheds/sky-snoq.htm>.

## IV. ON-THE-GROUND ACTIONS

Working in accordance with the principles for chinook salmon recovery developed by the Technical Committee, forty critical reaches within the Snoqualmie Watershed were identified as high priority protection sites for salmonid conservation and recovery. The *Snoqualmie/Skykomish Early Action Habitat Projects in King County* project booklet was developed to provide background information and proposed protection strategies for these reaches. The booklet outlines 14 areas for priority acquisition and 5 for restoration, and will assist with securing funding for these important endeavors.

Snoqualmie Watershed Forum members wish to convey both a sense of urgency to undertake on-the-ground actions quickly before the best habitat is degraded, and their preference for preserving habitat in the near term rather than having to restore it later. At the same time, the Forum wants to retain the flexibility to pursue restoration projects, especially where they help to improve connections between potential habitats. In addition to acquisition, there are a number of tools available by which to preserve habitat, such as conservation easements, and King County's Transfer of Development Credits and Public Benefit Rating Programs.

### Acquisition of High Quality Habitat

Last year, 152 acres of high quality chinook salmon habitat were protected in the Snoqualmie Watershed using federal and state grants, and local Conservation Futures funds. Purchases included:

- Nine acres along the lower Tolt River;
- Fifty-three acres along the lower Raging River;
- Thirty-one acres along the Snoqualmie River near the confluence with the Raging River , and
- Fifty-nine acres along the Snoqualmie River near the confluence with the Tolt River.

Another 56 acres downstream of the Tolt and Snoqualmie River confluence was donated by the Nestle Corporation.

Future areas identified for possible acquisition include areas that link critical reaches along mainstem Patterson Creek, middle Griffin Creek, the Snoqualmie River at river mile 34, and two sites along the Tolt River. King County was recently awarded nearly \$1 million in SRF Board funds to support these acquisitions. These funds will be matched with KCD funds endorsed by the Snoqualmie Watershed Forum.

The City of Snoqualmie is continuing to purchase repetitively flood-damaged homes from residential lots along the Snoqualmie River and to convert these properties to public parks and open space. These acquisitions help to restore floodplain functions and reduce the demand for bank armoring, which is consistent with the recommendations of the *Initial Chinook Work Plan*. Potential acquisition of Falls Crossing property through the Snoqualmie Preservation Initiative would preserve significant portions of shoreline wildlife habitat, including sections of Kimball Creek and property between State Route 202 and the Snoqualmie River. Additionally, the Cities of Snoqualmie and North Bend

have jointly acquired the Meadowbrook Farm Site, preserving a total of 453 acres for historic preservation and wildlife habitat, including shoreline on the South-Fork Snoqualmie River.

The City of Duvall recently purchased ten acres along the Snoqualmie River adjacent to the city limits. Purchase of the land will facilitate improvements to the City's sewer outfall to the Snoqualmie River. Purchase of this land also brings nearly all of the shoreline along the right bank of the Snoqualmie River in Duvall into public ownership.

## **Habitat Restoration Projects**

### ***Lower Griffin Creek Restoration Project***

Griffin Creek is the most productive coho salmon stream in the entire Snohomish Basin. King County, Washington Trout, and the Jobs for the Environment Program worked with three agricultural landowners along lower Griffin Creek to restore riparian habitat and address flooding problems on 80 acres of farmland. A 2,100-foot setback berm was constructed to provide ample floodplain area for Griffin Creek. In addition, within the setback berm and along both banks of the lower 3200 feet of the stream, more than 8,000 native plants were planted to provide shade, filter runoff, increase biotic activity, and eventually deliver large woody debris to the channel. Approximately 7000 feet of fencing was also installed to protect the stream and the plants from livestock. The fenced stream buffer in this reach averages more than 75 feet. Lastly, 40 pieces of large woody debris were placed in the stream channel, which creates stream habitat diversity.

This project substantially improved habitat on the lower 2/3 mile of the stream. The project reach now contains improved spawning and rearing habitat for a variety of salmonids and functions more effectively as a migration corridor for adults returning to spawn and juveniles heading out to sea. Water quality in the reach was improved by reducing both sun exposure and nutrient inputs from livestock.

### ***Patterson Creek Waterways Property Restoration Project***

Patterson Creek is a major producer of coho salmon, which spend at least a year in the freshwater environment as juveniles before moving to estuaries and the open sea. Deep, slow-moving segments of the channel (pools) play a major role in the survival rate of young fish. To enhance pool habitat on in the Patterson Creek floodplain, four, small, interconnected ponds in the wetland alongside the stream were constructed to provide additional pool habitat for juvenile salmonid rearing, particularly in the winter, when juveniles seek refuge from high flows. The ponds connect to the creek at the downstream end.

The soil from the ponds was placed in piles around the ponds to provide some drier ground on which conifer trees could become established. The soil hummocks mimic nurse log conditions in undisturbed portions of the wetland. Developing a technique to re-establish conifers in the wetland was an important element of this restoration project. Eventually, the trees will shade the ponds, keeping the temperature low in the summer and extending the duration of time the habitat is suitable for salmonids. The project also included the placement of twelve pieces of large woody debris in the project area.

### ***Revegetation Projects***

In addition, seven volunteer planting events were held last year along various stream reaches in the Snoqualmie Watershed. These plantings will help to stabilize banks and sedimentation rates, restore the riparian canopy, and keep water temperatures cool for salmon. Four planting events in the Snoqualmie Watershed are already planned for this spring and fall.

The City of Snoqualmie and King County recently completed the Meadowbrook Habitat Restoration and Riverbank Bio-stabilization Project on the Snoqualmie River to both stabilize eroding sections of riverbank and to enhance fish habitat. The project entailed anchoring large woody debris to sections of riverbank within the City to create a series of engineered logjams. These logjams serve to stabilize the riverbank against future erosion and to provide fish habitat. Native plants were planted along the banks to create additional shoreline habitat and eventually shade the water.

### **Potential Restoration Projects/Feasibility Studies**

King County will focus its restoration resources in the Snoqualmie Watershed on projects that restore watershed processes. Examples of critical watershed processes that are at risk in the Snoqualmie include the interaction of the river and its floodplain, the delivery of LWD to streams and rivers, and the delivery of sediment to water bodies. Systematic alterations of these natural processes have occurred over the past hundred years through construction of levees, revetments, and roads. King County is identifying opportunities to setback or remove levees and revetments at key locations in order to restore watershed processes support healthy habitat.

The first step toward successful restoration is the completion of a feasibility study. The study will model the outcome of a restoration action in an effort to prevent unintended consequences from compromising or nullifying potential benefits. For instance, a levee removal project that restores flood flows to a deforested floodplain may result in higher scour rates than desirable. In this case, the project is a high priority action (restoring floodplain functions), but other alterations on site may cause a negative response to a restoration of an historic function. Feasibility studies also identify any impacts an action may have to private property or public infrastructure, thereby preventing the county from harming other parties with interests or investments in the project vicinity.

A feasibility study of floodplain reconnection actions along the lower Tolt River is now underway, supported by funding from the City of Seattle and King County. The study will be completed by the end of 2001 and will provide a comparison of flooding, sediment accumulation, and fish habitat conditions in a no action versus a functioning floodplain reconnection scenario.

In 2001, several additional feasibility studies will be conducted. Two studies will look at the likely outcomes of levee removals on King County owned properties on the mainstem Snoqualmie and on the Raging River. Another study will look at the benefits of different road decommissioning approaches on a county road along Stossel Creek. The studies will also substantially benefit the effort to obtain permits and grant funding for the projects. The result will be well-conceived proposals that have a high likelihood of receiving grant funding.

## Changes in Local Regulations and Programs

Local governments in the Snoqualmie Watershed are have already started to make changes, and/or are anticipating changes in local regulations that should enhance salmon conservation and provide opportunities to incorporate protections needed for compliance with ESA. Changes underway or proposed include:

- The City of Snoqualmie is currently completing an update to its Shoreline Master Program. As part of this update, the city will reduce the density of development permitted on undeveloped lots in the 100-year floodplain, and strengthen protection of channel migration hazard areas.
- The City of Carnation recently revised and updated its Shoreline Master Plan. The city has received King Conservation District funds to update develop a Stormwater Management Plan and financing for a Stormwater Management Program in 2001. The City of Carnation has also developed a Sewer Comprehensive Plan, and is moving forward with efforts to design and construct a wastewater treatment plant.
- The City of North Bend is taking steps to establish and or update the following programs and regulations that have direct impacts to salmon habitat:
  - Preparation of a new Storm Water Management Plan and Stormwater Utility to implement stormwater capital projects and system maintenance procedures;
  - Preparation of a new Flood Hazard Reduction Plan and revised Floodplain Management Regulations;
  - Revisions to the North Bend Comprehensive Plan and Development Regulations to increase protection for rivers, streams, channel migration corridors and wetlands;
  - Preparation of revisions to the Shoreline Master Program and Development Regulations to integrate the shoreline plan and comprehensive plan; and
  - Preparation of revisions to the North Bend Sensitive Area ordinance in a manner consistent with best available science and the direction coming from the ESA listings.

All of these updates are intended to be carried out in a manner consistent with direction coming from ESA listings.

- King County is developing a Fish and Wildlife Habitat Conservation Areas Ordinance that would implement the Management Zone concept that is part of the Tri-County Model 4(d) Proposal. The County has also initiated an update of its Flood Hazard Reduction Plan with a strong focus on integrating salmon conservation actions with flood hazard reduction efforts. Last year, the King County Council authorized an expansion of King County's Surface Water Management program to unincorporated portions of rural King County, including the Snoqualmie Watershed. Program goals include addressing stormwater problems while protecting rural livelihoods, supporting King County's growth management objectives, and complying with local, state, and federal regulations.
- Seattle-King County, the local health district, is working on a program to help ensure that regulations for septic systems are carried out and that all septic systems are properly operated and maintained. The new regulations adopted in 1999 require that septic system designers, installers, and maintainers be certified and report on their work. They also increase the design

standards used for new or modified systems and require annual inspections of septic systems. New homeowners will be given notice, in deed records, that they have a septic system when they buy a house, so that they can be responsible for the system. The program also includes development of a database of owners that will allow distribution of brochures about maintenance, and will also help plan possible new sanitary sewer connections to serve areas where problems are recurring. It will also develop a funding mechanism that will sustain these activities over the long term.

## **V. RECOMMENDED COOPERATIVE WORK BY PARTIES TO THE SNOQUALMIE WATERSHED ILA**

The recently executed Snoqualmie Watershed ILA provides for the joint development and review of the Snohomish Basin Conservation Plan, staff support of the Snoqualmie Watershed Forum, and cooperative work by jurisdictions intended to comply with the Endangered Species Act. The ILA provides for 2.5 King County staff members with expertise in watershed planning, policy analysis, and public involvement. Based on the current guidelines for salmon conservation planning and the current status of salmon conservation planning efforts in the Snohomish Basin, cooperative work by the parties to the ILA should focus on the areas listed below. Please see Appendix C for a tentative schedule of Snoqualmie Watershed Forum meeting topics and decisions that is intended to carry out these priorities.

### **Participate in Snohomish Basin Salmon Conservation Planning**

Continued participation by local governments in the Snohomish Basin Salmon Recovery Forum is crucial for the development a plan that will reflect issues and conditions within the Snoqualmie Watershed. The focus of conservation planning efforts in 2001 will be on the development of the Snohomish Basin NTAA. Staff members have identified likely decision points and opportunities for the Snoqualmie Watershed Forum and local jurisdictions to influence the NTAA. Please see Appendix C for a tentative schedule of Snoqualmie Watershed Forum topics and decisions for more detail.

### **Make Watershed-Scale Recommendations on Funding for Projects**

The Snohomish Basin NTAA will include science-based principles to help guide habitat protection and restoration projects, as well as specific projects. There is an opportunity for the Snoqualmie Watershed Forum to recommend specific projects for inclusion in the NTAA. Endorsing a list of projects that is consistent with these principles should also enhance chances for securing federal and state funds through the State Salmon Recovery Funding Board.

The Snoqualmie Watershed Forum will be asked to allocate approximately \$300,000 in KCD funds for regional fish habitat restoration, flood hazard reduction, and water quality projects. Guidance from the Snohomish Basin NTAA should be incorporated into the review of projects for KCD funding.

### **Jointly Review Local Regulations and Policies to Address ESA Compliance Issues**

Updating local regulations and policies to comply with the ESA is a high priority for local governments in the Snoqualmie Watershed. One purpose of the ILA is to “provide a mechanism for cooperative review and development of recommended policies and regulations needed for compliance under ESA.” Although regulatory compliance is ultimately the responsibility of each local government, it makes more sense to consider potential regulatory gaps and solutions in a watershed context. Guidance for regulatory review is available in the 4(d) rule and the Tri-County Model 4(d) proposal. More specific guidance for the Snohomish River Basin will stem from the

Snohomish Basin NTAA. Staff members from the four Snoqualmie Valley Cities and King County are working together to lay out an approach for this joint review. They should also continue to share information on local approaches being taken for regulatory updates (e.g., Shorelines)

### **Improve Public Awareness and Involvement in Salmon Conservation Efforts**

Decisions about changes in local land use policies and regulations and proposals for funding for salmon conservation efforts are likely to be controversial. Staff members should expand efforts to make the public aware of salmon conservation issues, local habitat resources, and opportunities to participate in the Snohomish Basin Conservation Planning process. Staff member's efforts should focus in the following areas:

- Continue with targeted workshops in the Snoqualmie Watershed to complement wider public outreach and involvement efforts in the Snohomish Basin.
- Develop a self-guided tour for the Snoqualmie Valley Trail that highlights the values of side channels, oxbows, riparian forest, and the impacts that land uses throughout the watershed can have on habitat.
- Assemble a Snoqualmie Watershed/ESA display(s) that can be taken to local festivals by volunteers and staff members.
- Update the existing Snoqualmie Watershed web site and improve links with citizen groups, cities, and agencies. Look for opportunities to use existing County and Cities web sites to disseminate information.

### **Review and Approve Budget and Work Program for Cost-Shared Work in 2002**

The Snoqualmie Watershed ILA calls for review and approval of a proposed work program and budget by September so that local governments can make budget decisions. The ILA also calls for an annual review of King County as Service Provider.

### **Stay Informed about Related Watershed Issues/ Consider Work Program Adjustments**

The Snoqualmie Watershed Forum will be most effective if it can focus its efforts in a few key areas. However, matters may arise that have a strong tie to other watershed issues or local priorities. An example is the potential initiation of water supply planning efforts in the Snohomish Basin. When new issues arise, the Snoqualmie Watershed Forum should consider carefully whether to "take on" a new issue, based on priority relative to existing areas of focus, the scope of the ILA, and the likely benefits in pursuing an issue at the watershed level.



## **Appendix A**

### **Acronyms Used in this Report**

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BMPs	Best Management Practices
ESA	Endangered Species Act
GIS	Geographic Information System
GMA	Growth Management Act
GPS	Geographic Positioning System
ILA	Interlocal Agreement
KCD	King Conservation District
WLRD	King County Water and Land Resources Division
LWD	large woody debris
MRCI	Municipal, Residential, Commercial, and Industrial Development and Redevelopment Limit
NMFS	National Marine Fisheries Service
NTAA	Near-Term Action Agenda
SRF	Washington State Salmon Recovery Funding Board
TRT	Technical Recovery Team
USFS	United State Forestry Service
USFWS	United States Fish and Wildlife Service
UW	University of Washington
WDFW	Washington State Department of Fish and Wildlife
WDOE	Washington State Department of Ecology
WRIA	Watershed Resource Inventory Area

## Appendix B

### Where to Obtain the Reports and Information Referenced in this Strategy

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#### Reports

- **Tri-County WRIA Planning and Assessment Framework:** [www.salmoninfo.org](http://www.salmoninfo.org) or toll-free at 1-877-SALMON-9 (1-877-725-6669)
- **Citizen's Guide to NMFS' 4(d) Rule:** [www.nwr.noaa.gov/1salmon/salmesa/4ddocs/citguide.htm](http://www.nwr.noaa.gov/1salmon/salmesa/4ddocs/citguide.htm)
- **4(d) Rule Implementation Binder for Threatened Salmon and Steelhead on the West Coast:** [www.nwr.noaa.gov/1salmon/salmesa/4ddocs/4dwsbinder.htm](http://www.nwr.noaa.gov/1salmon/salmesa/4ddocs/4dwsbinder.htm)
- **Draft State's Watershed Planning Guidelines for Salmon Conservation:** [www.governor.wa.gov/esa/](http://www.governor.wa.gov/esa/)
- **Initial Snohomish River Basin Chinook Salmon Conservation/Recovery Technical Work Plan:** For copies contact Snohomish County Surface Water Management Division at (425) 388-3464.
- **Snoqualmie/Skykomish Early Action Habitat Projects in King County:** For copies contact Kirk Anderson, Snoqualmie Basin Steward, at (206) 296-1948.

#### Information

- **Technical Recovery Team Activities:** <http://research.nwfsc.noaa.gov/cbd/trt/>
- **Snoqualmie Watershed Web Page:** <http://splash.metrokc.gov/wlr/watersheds/sky-snoq.htm>
- **King County Volunteer Event Calendar:** <http://dnr.metrokc.gov/wlr/PI/calendar.htm>
- **EPA Surf Your Watershed:** [www.epa.gov/surf/index.html](http://www.epa.gov/surf/index.html)
- **Northwest Aquatic Information:** [www.streamnet.org/](http://www.streamnet.org/)
- **National Marine Fisheries Service:** [www.nmfs.noaa.gov/](http://www.nmfs.noaa.gov/)
- **Washington State Department of Natural Resources:** [www.wa.gov/dnr/#](http://www.wa.gov/dnr/#)
- **United States Fish and Wildlife Service:** [www.fws.gov](http://www.fws.gov)
- **Official Listing of Puget Sounds Chinook Salmon in the Federal Register:** [www.metrokc.gov/exec/esa/fedreg032499.txt](http://www.metrokc.gov/exec/esa/fedreg032499.txt)

**Appendix C**  
**Draft Meeting Schedule and Anticipated Issues Work Plan**  
**for the Snoqualmie Watershed Forum in 2001**

Meeting Date	Anticipated Issues	Possible Actions
<p><b>May 2</b></p> <p><i>Snoqualmie Public Works Facility 7-9 pm</i></p>	<ul style="list-style-type: none"> <li>• <b>Snohomish Basin Near-Term Action Agenda (NTAA):</b> Review draft principles, guidance for local governments, and watershed goals.</li> <li>• <b>Allocation of 2001 King Conservation District (KCD) Funds</b> <ul style="list-style-type: none"> <li>➤ Progress on existing grants</li> <li>➤ Areas of focus for 2001</li> </ul> </li> <li>• <b>Water Resource Planning in the Snohomish Basin</b> <ul style="list-style-type: none"> <li>➤ Initiation of 2514 water supply planning</li> <li>➤ Presentation on the North Bend - Snoqualmie Aquifer Project</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Agree on comments that should be conveyed to Snohomish Basin Salmon Recovery Forum at its May meeting.</li> <li>• Agree on areas of focus for King Conservation District Funding in 2001 (based in part on draft principles in NTAA).</li> </ul>
<p><b>July 11</b></p> <p><i>Carnation City Council Chambers Field trip: 5-7 pm Meeting: 7-9 pm</i></p>	<ul style="list-style-type: none"> <li>• <b>Field trip to Griffin Creek restoration projects (dinner provided)</b></li> <li>• <b>Snohomish Basin NTAA:</b> <ul style="list-style-type: none"> <li>➤ Review and discuss public review draft of NTAA (this item depends on release date of public review draft).</li> <li>➤ Review staff proposal for specific protection and restoration projects and incentives programs (e.g., tax incentives, easements) to be included in NTAA.</li> </ul> </li> <li>• <b>Allocation of 2001 KCD funds.</b></li> </ul>	<ul style="list-style-type: none"> <li>• Outline major comments or areas of concern with NTAA to be included in comment letter from Snoqualmie Watershed Forum.</li> <li>• Discuss and recommend local strategy for review of NTAA by general public and local jurisdictions (council briefings, etc.)</li> <li>• Make final recommendation to KCD Board of Supervisors on projects to be funded with 2001 KCD funds.</li> </ul>

<p><b>September 5</b></p> <p><i>North Bend Senior Center</i> 7-9 pm</p>	<ul style="list-style-type: none"> <li>• <b>Tri-County Model 4(d) Proposal:</b> Update (if available) on current status and the results of the Biological Review.</li> <li>• <b>Joint Review of Local Regulations and Policies:</b> Staff proposal for joint review of local regulations and policies based on 4(d) rule, recommendations in Snohomish Basin NTAA, and current Tri-County Model 4(d) proposal.</li> <li>• <b>2002 Work Program and Budget for Cost-Shared Work</b></li> </ul>	<ul style="list-style-type: none"> <li>• Recommend approach for joint review of local regulations and policies; authorize staff work to proceed.</li> <li>• Finalize and approve proposed 2002-work program and budget for cost shared work.</li> </ul>
<p><b>November 7</b></p> <p><i>Rose Room, Duvall Public Library</i> 7-9 pm</p>	<ul style="list-style-type: none"> <li>• <b>Snohomish Basin NTAA</b></li> <li>• <b>Joint Review of Local Regulations and Policies:</b> Preliminary outcome of staff work.</li> <li>• <b>First Year ILA Progress Report:</b> <ul style="list-style-type: none"> <li>➤ Report from King County, as service provider</li> <li>➤ Amendments to the ILA?</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Make recommendation to local governments in the Snoqualmie Watershed on whether to adopt NTAA.</li> <li>• Reach agreement on Snoqualmie Watershed Forum position to be conveyed at November Recovery Forum meeting.</li> <li>• Review and discuss major issues arising from joint review of local regulations and policies.</li> <li>• Evaluate King County as Service Provider of the ILA.</li> <li>• Determine whether amendments are needed to ILA, based on first-year experience.</li> </ul>

Additional meetings may be convened on an as-needed basis.