A Review of Salmon Recovery Planning Efforts to Date
And
A Proposal to Coordinate Development of
Watershed Recovery Plans
For Listed Salmon in Eastern Clallam County
(Dungeness and Elwha River Watersheds)

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Abstract

The listing of various salmonid populations under the Endangered Species Act has obligated the federal agencies involved in the listing to create plans to protect these species against extinction, as well as provide for the species' recovery. The *Shared Strategy for Puget Sound* provides for local development of these protection and recovery plans, building upon watershed-based efforts.

This document evaluates the status of watershed based salmon recovery planning efforts within Eastern Clallam County - specifically the Jimmycomelately Creek, Dungeness River, Morse Creek, and Elwha River watersheds. The status of the planning efforts is evaluated against the 5-steps to recovery planning outlined by the Puget Sound Tech. Rev. Team and the Shared Strategy Staff Group (2003). This plan further proposes a framework to coordinate efforts in the key watersheds of Eastern Clallam County in order to complete recovery planning within the schedule described by the Shared Strategy process.

This framework relies heavily upon the groundwork laid by the Dungeness River Management Team and the Initiating Governments for water use planning, conducted under the provisions of the Watershed Planning Act (ESHB 2514). However, the framework seeks to expand upon these forums to: secure a commitment from all affected local governments, organizations and agencies to participate in recovery planning as envisioned by the Shared Strategy; increase emphasis on recovery planning for bull trout; incorporate a strong near shore marine component to recovery planning; incorporate a long range vision for recovery planning (20-, 50-, and 100-years), and; coordinate with the National Park Service to develop a comprehensive recovery plan for the Elwha River Watershed which includes both the strategy to reintroduce salmon into the upper Elwha River Watershed following dam removal as well as efforts to recover salmon in the watershed which are outside the jurisdiction of the Elwha River Ecosystem and Fisheries Restoration Act and the National Park Service.

This document is also intended to fulfill Tasks 2.02 (Create a communication bridge between the regional salmon recovery effort and those in the Dungeness and Elwha watersheds) and Task 5.01 (Prepare Annual Report) of the Salmon Recovery Planning Grant Cooperative Agreement (Grant # 38030309) between the Washington Dept. of Fish and Wildlife and Clallam County.

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I. Introduction

The listing of Puget Sound chinook salmon, Hood Canal summer chum, and bull trout under the Endangered Species Act (ESA)[1] has obligated the federal agencies involved in the listing to create plans to protect these species against extinction, as well as provide for the species' recovery. The *Shared Strategy for Puget Sound*[2](Shared Strategy), a cooperative effort supported by NOAA Fisheries, U.S. Fish and Wildlife Service (USF&WS), Governor Gary Locke, Puget Sound Tribes, state natural resources agencies, local governments and key non-government organizations, provides for local development of these protection and recovery plans, building upon watershed-based efforts. However, the time available to develop a recovery plan is finite. The aggressive schedule for development of recovery plans envisions that plans will be agreed to by June of 2005.

The purpose of this document, funded through a grant from the Washington Dept. of Fish and Wildlife (WDF&W) to Clallam County (Grant #38030309) is to evaluate the status of salmon recovery planning in Eastern Clallam County, relative to the guidelines provided by the Shared Strategy and WDF&W. This document also proposes a pathway to integrate a myriad of watershed planning activities into a coordinated salmon recovery plan.

Efforts to recover salmon populations in the Dungeness, Elwha, and other watersheds have been underway for well over 20 years, predating the listing of Puget Sound chinook, Hood Canal summer chum, and bull trout. These efforts have periodically been delayed or thwarted, due to the inability of the available processes to adequately address all of the issues limiting the potential for recovery. In some cases, not all necessary stakeholders have been involved in recovery planning. In other cases, avenues to change existing laws were not available, or the political will to take the steps necessary to change the status quo did not exist.

The listing of various salmon populations in Washington State, along with the listing of other species (e.g. the Marbled Murrelet and the Spotted Owl) stimulated a critical review of land and water use practices within the State, resulting in a suite of new legislation designed to facilitate watershed based planning. This new legislation, combined with

[1] For a comprehensive list of acronyms and definitions, see Appendix C.
[2] For more information regarding the *Shared Salmon Strategy for Puget Sound*, go to www.sharedsalmonstrategy.org

existing planning processes, provides the framework to create a comprehensive "watershed plan" for the recovery of salmon, as envisioned by the *Shared Strategy for Puget Sound*.

The Technical Recovery Team (TRT) for the National Oceanographic and Atmospheric Administration (NOAA Fisheries) identified 22 discrete chinook salmon populations within the Puget Sound Evolutionary Unit (ESU) which the TRT believes represent the genetic and phenotypic spectrum of the ESU. Both the Dungeness and Elwha chinook stocks were included in the TRT's list. NOAA will consider actions targeting the recovery of these two populations, along with known populations of Hood Canal summer chum in the County, while the USF&WS will consider actions targeting the recovery of bull trout. It would be in the interests of the residents of Clallam County to ensure that these recovery actions were developed locally, as those most affected by the listing would have a voice in developing the recovery plans.

II. Salmon Recovery Planning

The State of Washington (State) and the TRT have each developed a draft template for creating watershed recovery plans. Both templates strive to achieve essentially the same objective: to define the content of a recovery plan as required by ESA. The ESA states that a recovery plan must include:

> … *"objective, measurable criteria, which, when met, would result in a determination…that the species be removed from the list;"*
>
> … *"a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species."*
>
> … *"estimates of the time required and the cost to carry out those measures needed to achieve the plan's goals and to achieve intermediate steps towards that goal."*[3]

While the TRT template is technically driven, focusing on *"objective, measurable criteria"* (Puget Sound Tech. Rev. Team and Shared Strategy Staff Group, 2003), the State model focuses more on process (WDF&W, 2003). The stated objective of the TRT template is to describe "*the biological content of a recovery plan, directed to ultimately fulfill obligation of the Endangered Species Act (ESA) and address broader recovery goals."* The objective of the State model is *"to provide guidance that lends consistency among the different salmon recovery planning groups and products being developed in Washington."* In fact, these two documents are complementary, and as such both should be used to guide participants in local recovery planning efforts to develop watershed recovery plans for Eastern Clallam County.

[3] Endangered Species Act, Section 4 [16 U.S.C. 1533] (f) (1) (B)

III. Local Planning Forums

Under the Shared Salmon Strategy, "Regional Recovery Plans" are intended to build upon "watershed plans" and data in order to address all the factors necessary for salmon recovery within the region. The governments within Clallam County, along with interested citizens, are working on individual components of what could constitute a coordinated salmon recovery strategy for this area. For example, a limiting factors analysis (LFA) has already been completed for WRIA 18 (Dungeness-Elwha watershed). In addition, through the ESHB 2496 Salmon Recovery Plan Act ("2496"), the North Olympic Peninsula Lead Entity (NOPLE) has developed a strategy for identifying habitat restoration projects that can begin to address these limiting factors. Although this can be a component of a "watershed plan", it does not encompass all of the efforts underway.

Within WRIA 18, a multitude of salmon recovery planning forums are in operation. Some, like the work of the Dungeness River Management Team and the Elwha River Ecosystem Restoration Plan, have been ongoing since the mid-1980's. Other efforts, like the Elwha/Morse Management Team, did not begin until the passage of the ESHB 2514 Watershed Planning Act ("2514"). Still others, like the development of the Dungeness River Comprehensive Irrigation District Management Plan (CIDMP), did not begin until this year with the advent of the Agriculture, Fish, and Water (AFW) forum. Following is a brief description listing the salmon recovery efforts underway in WRIA 18, and the focus of each effort.

1) Dungeness River Management Team (DRMT) - The DRMT got its start in the mid-1980's in response to serious summer low flow events in the Dungeness River. The Jamestown S'Klallam Tribe approached the local irrigation districts about taking steps to conserve water to ensure that enough water remained in the river to provide fish passage and meaningful habitat for salmon. From this initial step grew a cooperative water planning process that was formalized by the "Chelan Agreement". In more recent years, the DRMT has evolved to become a basin recovery team, serving as the planning unit for the "2514" process and as the citizens group for the "2496" process. A "2514" watershed plan for the basin is nearing completion, and should be finalized before the end of 2003. Development of this plan is coordinated by the Initiating Governments for the area, also known as the Elwha-Dungeness Coordinating Council (EDCC) (WRIA 18 Memorandum Of Understanding, December 9, 1998). The Initiating Governments include Clallam County, Port Angeles, the Jamestown S'Klallam Tribe, the Lower Elwha Klallam Tribe, and the Agnew Irrigation District. The EDCC (or "Initiating Governments") also coordinates the efforts of the Elwha-Morse Management Team (see below) and serves as the forum to discuss crossover issues between the two planning efforts.

2) Elwha/Morse Management Team (EMMT) – EMMT was established per RCW90.82/ESHB 2514 by the local governments and major water users as the watershed planning unit for all river systems from Morse Creek west to the Elwha

River. A stated goal of EMMT is to "complement the Elwha River restoration process in assuring implementation of the goals defined in the Elwha River Ecosystem and Fisheries Restoration Act (Public Law #102-495)". A "2514" watershed plan for the basin is nearing completion, and should be finalized before the end of 2003. As noted above, the EDCC coordinates the work of EMMT in the development of this plan.

3) Marine Resource Committee (MRC) – The Clallam County MRC is affiliated with the Northwest Straits Marine Conservation Commission (NSMCC), an organization formed by congressional action in 1998 to address the serious depletion of marine resources in the Strait of Juan de Fuca. The MRC's self-stated job is "to discover collaborative ways to improve shellfish harvest areas, protect marine habitat, support salmon and bottom fish recovery and examine resource management alternatives". Though not specifically focused on listed salmon species, the MRC is committed to the management, protection and restoration of nearshore habitat upon which salmon depend. Parties to the MRC include Clallam County, Port Angeles, Sequim, WDF&W, the Makah Tribe, Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, Puget Sound Water Quality Action Team and various local citizens representing the fishing industry, education, environment and other interests.

4) Dungeness River Comprehensive Irrigation District Management Plan (CIDMP) – The Dungeness River CIDMP is a pilot project intended to facilitate compliance of the operation of the irrigation systems with ESA as well as the Clean Water Act. The CIDMP is an outgrowth of the "Agriculture, Fish and Water" (AFW) process, and utilizes the "*Guidelines for Preparation of CIDMP's*" issued in May of 2001. Work on the CIDMP is just beginning this year, and involves the irrigation districts, Clallam County, WDF&W, USF&WS, USDA, NOAA, and the Jamestown S'Klallam Tribe.

5) North Olympic Peninsula Lead Entity (NOPLE) – NOPLE facilitates the implementation of ESHB 2496 in WRIA's 17 (Sequim Bay watersheds only), 18, 19, and 20; from Sequim Bay to the Hoh River. Specifically, NOPLE is focused upon identifying and prioritizing salmon restoration projects for the area covered by its jurisdiction. It also serves as the pathway for communication between the Salmon Recovery Funding Board and the members of NOPLE. Membership in NOPLE includes the Jamestown S'Klallam Tribe, Lower Elwha Klallam Tribe, Makah Tribe, Quileute Tribe, Hoh Tribe, Clallam County, Jefferson County, Sequim, Port Angeles, and Forks. In addition, NOPLE has created three local citizen-based groups and a local technical review group who assist in the identification of critical salmon recovery issues, provide for public outreach, and prioritize local salmon recovery projects.

6) Elwha River Ecosystem and Fisheries Restoration Act, P. L. 102-495 (EREFRA) - In 1968 the owner of two hydro-power facilities on the Elwha River applied to the Federal Energy Regulatory Commission (FERC) for a 50-year operating license for the Elwha Dam. In 1973, the owner also applied to renew the existing 50-year license

for the Glines Canyon Dam. A lawsuit was initiated against FERC by the Department of Justice, representing the Department of Commerce and Department of Interior, regarding FERC's claim of licensing jurisdiction over Glines Canyon Dam, as that dam is located within Olympic National Park. In 1992, to extinguish the lawsuit and avoid future litigation relating to the licensing process, Congress passed P.L. 102-495, which called for a specific plan to remove the two dams and restore the basin's fish runs. This report was completed in1994 (DOI, et. al., 1994). Subsequently, in 1995 (DOI) and 1996 (DOI), two Environmental Impact Statements (EIS) were completed which evaluated the potential options for dam removal and fish restoration. Since that time, a group of fisheries scientists from the NPS, USF&WS, NOAA, USGS/BRD, WDF&W, the Lower Elwha Klallam Tribe and Clallam County have continued to work on refining the plan to reintroduce salmon into the upper watershed, following dam removal. The Dept. of Interior has purchased both dams, and dam removal is currently scheduled to begin in 2007.

7) Land Use Planning (Comp. Plan) – Local, State, and Federal laws govern the manner in which private and public lands may be utilized to ensure protection of certain public interests. Clallam County has developed a draft report entitled "*Towards Recovery*", which attempts to capture those land use strategies adopted by the County which will protect freshwater and salmonid habitat from further detrimental degradation and will facilitate recovery of habitat over the long term. Other governmental jurisdictions within WRIA 18 have taken similar measures, although they have not yet summarized their actions as the County has done. In addition, land use planning is an adaptive process and changes in policy are to be expected over time. These changes may be critical to the success or failure of salmon recovery in WRIA 18. For Clallam County, the vehicle for incorporating policy changes in land use planning is the Clallam County Comprehensive Plan (CCC 31.02). Of course other jurisdictions have their own similar processes.

8) Harvest and Hatchery Management – The local Tribes and WDF&W (co-managers) jointly develop harvest and hatchery management plans in the area. Unlike the other salmon recovery processes in WRIA 18, these two items are facilitated through a statewide (or even region-wide) process with very little input from local governments. Certain aspects of hatchery planning may involve more input from local stream-based teams, as seen with DRMT's involvement in the chinook enhancement program for Dungeness River chinook. On the whole, though, local involvement is limited. The integration of these two components with other salmon recovery processes is critical to the ultimate success of a watershed recovery plan for this area.

9) Streamkeepers of Clallam County – Streamkeepers is a citizen-based watershed monitoring program coordinated through Clallam County's Dept. of Community Development. The program is composed of a network of volunteers dedicated to providing monitoring assistance to watershed planning groups and habitat restoration sponsors. The stated program goals are to provide credible data to natural resource planners and the public, undertake small-scale restoration projects, and facilitate public involvement in stream monitoring and watershed stewardship.

10) Clallam Conservation District – The Clallam Conservation District (CCD) is a non-regulatory political subdivision of State government, affiliated with the U.S. Dept of Agriculture. The primary role of the CCD is to work with the local agricultural community on the conservation of natural resources, (including soil, water, fish, wildlife, etc.) through the implementation of a variety of federal and state programs. The CCD also serves as a technical resource to the agricultural community for natural resource planning as well as a partner or proponent for specific recovery projects

11) Stream Focus Groups – A number of grass roots organizations are engaged in stream specific planning for salmon recovery. These efforts range from well-organized coalitions to individual citizens who have an interest in meaningful participation in the salmon recovery process. These planning groups may stand on their own, or rely on umbrella organizations like the North Olympic Salmon Coalition (NOSC – a non-profit organization dedicated to the conservation of salmon, through the implementation of stream restoration projects) or Streamkeepers . The work each group completes may be as simple as the gathering of baseline environmental information or as complex as undertaking major watershed planning and restoration projects.

In the above listed processes, the participants in each forum are comprised of the same local governments and entities, and often the same individual representatives. Although this provides continuity between the forums, there is no clear approach to integrate all of the processes. Further, there is no comprehensive local effort to tie all of these various forums into the Puget Sound Regional Recovery Plan through the Shared Strategy process.

IV. Evaluation of Existing Recovery Planning Efforts

NOAA Fisheries has provided guidance that recovery planning should be grounded in the concept of a *Viable Salmonid Population* (VSP). They go on to define a VSP as "an independent population that has a negligible risk of extinction due to threats from demographic variation, local environmental variation, and genetic diversity changes over a 100-year time period" (McElhany et al., 2000). The key elements of a VSP include abundance, productivity, spatial structure, and diversity (Appendix A). The TRT and Shared Strategy (2003) have suggested utilizing 20-, 50-, and 100-year planning horizons to evaluate actions intended to achieve VSP.

The vision for the Shared Strategy planning process is to develop a plan that achieves the requirements for a VSP for Puget Sound Chinook and Hood Canal Summer Chum. Five steps have been identified for fulfilling this vision:

Step 1. Recovery Plan Outline: Develop an outline for a recovery plan that addresses the needs of the Endangered Species Act (ESA) and broader regional goals.

Status – WDF&W as well as the TRT have provided this Outline in the draft "Salmon Recovery Plan Model" (WDF&W, June 2003) and "Integrated Recovery Planning for

Listed Salmon: Technical Guidance for Watershed Groups in Puget Sound" (TRT and Shared Strategy, 2/3/03). Ultimately, the local planning efforts will need to develop their own plan based upon these outlines.

Step 2. Planning Targets: Define the abundance, productivity/growth rates, diversity, and spatial structure desired for each population.

Status – Dungeness Chinook

For Dungeness chinook, planning targets have been completed with the assistance of the co-managers, using a modified Ecosystem Diagnostic and Treatment (EDT-"Lite") model. The DRMT reviewed and tentatively agreed with the model results. The Jamestown S'Klallam Tribe (2003) has presented the goals as follows:

DUNGENESS CHINOOK ESCAPEMENT PLANNING TARGETS IN COMPARISON WITH MEAN ESCAPEMENT OVER THE LAST FIFTEEN YEARS

Escapement Planning Targets with Productivity in Parentheses		Mean Escapement (1987 – 2001)
4,700 (1.0*)	1,200 (3.0*)	123

**Note: Productivity is expressed as adults produced per spawner*

The first escapement target (4,700) is an indication of the carrying capacity of the system. At higher levels of escapement, the success of the spawning population will drop below the 1:1 replacement level. As an example, if 5,500 returned to the river to spawn, the next generation's return might be just 5,000 fish. The second escapement target (1,200) is the size of the spawning population at which the production per spawner is maximized (each fish produces three fish in the next generation). Another way of thinking of these targets is that the first target reflects the stable population size without fisheries. Under the second target, the total run size is slightly smaller, at 3,600 fish (1,200 x 3.0), but up to 2,400 fish are potentially available for harvest. It must be noted, though, that recovery planning must accommodate both escapement and productivity (adults/spawner). In other words, achieving an escapement level of 1,200 fish does not constitute recovery, if the productivity hasn't reached 3.0 adults/spawner. It should be further noted that the two planning targets represent the end-points of a range of values along a curve, all of which represent recovery. Between escapement levels of 1,200 fish and 4,700 fish, the productivity (or recruits/spawner) varies in inverse proportion to the escapement. That is, within the described range, as spawning abundance increases, the productivity of each spanwner goes down and vice versa.

The diversity of the Dungeness chinook population has been described. Historical information indicates that the stock was primarily an early timed population (spring/summer), with young emigrating to sea predominately in their first summer, with a small component of the population continuing to reside in the river for an additional year (Lichatowich, 1992, and; Hirshchi and Reed, 1998). Genetic analysis and field observations indicate that these diversity indicators remain intact.

The co-managers and DRMT have further reported that Dungeness chinook historically utilized 18.9 miles of the mainstem, 5.1 miles of the Gray Wolf River, and the lower areas of Gold Creek (WDF&W and WWTIT, 1994; JKST, 2003). Fish continue to spawn throughout the majority of the basin, although recent spawning data appears to indicate that the upper watershed may be underutilized (JKST, 2003).

Elwha Chinook

For Elwha chinook, the EREFRA participants developed recovery planning targets as part of the completion of the EIS process (DOI, 1995). The results have been reviewed by the co-managers, but have not been officially forwarded to NOAA Fisheries as stated "recovery goals" in the context of ESA. However, NOAA Fisheries staff participated in both the development of the goals as well as the review of the dam removal plan for compliance with ESA. The results of the EREFRA work have not presented to EMMT, although they were available for review by the general public during completion the EIS's.

It is important to note that the following values should be considered as interim goals, as they were developed using selected estimates of productivity and carrying capacity from other streams, without any direct knowledge from the Elwha. Following dam removal, monitoring of the recovery of chinook in the basin would likely lead to the development of alternative recovery goals. A spawner/recruit type model incorporated into the EIS process produced these estimates for abundance and productivity (Elwha Tribe, 2003 Draft Report):

ELWHA CHINOOK ESCAPEMENT PLANNING TARGETS IN COMPARISON WITH MEAN ESCAPEMENT OVER THE LAST FIFTEEN YEARS

Escapement Planning Targets with Productivity in Parentheses		Mean Escapement (1987 – 2001)
20,329 (1.0*)	6,900 (4.6*)	1,319

**Note: Productivity is expressed as adults produced per spawner*

Like Dungeness chinook, the diversity of the Elwha chinook population has been described. Historical information indicates that the stock exhibited both a spring timing, along with a summer/fall type component. It is assumed that smolts predominantly emigrate during their first year (0-age), but that a portion of the population would also emigrate as "yearlings". Work conducted by Dilley and Wunderlich (1990) appears to confirm this assumption.

Local knowledge reports that the early component tended to have a peak return in late-June or early-July (Dick Goin, pers. com.). This was confirmed by test fishery studies conducted by the Elwha Tribe and Point No Point Treaty Council (PNPTC) in the mid-1990's. At that time the return to the river exhibited a bimodal timing, with an early peak in late-June and a second peak in mid-August (PNPTC, unpublished data). Though once strong, this early component currently represents less than 1% of the total return.

Genetic analysis conducted by WDF&W indicates that the genetic profile for this stock is significantly different from that of all other Puget Sound populations (WDF&W and WWTIT, 1994).

Due to the construction of the Elwha Dam, spawning of Elwha chinook has been limited to the lower 4.9 miles of the river since 1914. The accessible area is seriously degraded by the presence of both the Elwha Dam and the Glines Canyon Dam, which is located further upstream. It is estimated that historically the Elwha chinook run utilized 42.9 miles of mainstem habitat, along with an additional 14.1 miles of tributary habitat. Therefore the presence of the two dams has eliminated approximately 85% of the available chinook habitat. The early-timed component of the stock undoubtedly used the upper reaches of the river, so 100% of their preferred habitat has been eliminated.

Morse Creek Chinook

The co-managers have utilized an "EDT-lite" model to develop a preliminary estimate of recovery goals for this stock. However as the stock appears to be extirpated from the system, very little emphasis has been put into completing these goals.

Summer Chum

For summer chum salmon in Clallam County, recovery goals are nearing completion by the co-managers. The primary summer chum population in the County inhabits Jimmycomelately Creek, located at the head of Sequim Bay. An additional population exists in the Dungeness River, but very little information is available for that stock, and it has not currently been considered in the establishment of recovery goals.

The PNPTC and WDF&W (2003) have prepared the following interim goals:

JIMMYCOMELATELY SUMMER CHUM ESCAPEMENT PLANNING TARGETS IN COMPARISON WITH MEAN ESCAPEMENT OVER THE LAST FIFTEEN YEARS

Escapement Planning Targets with Productivity in Parentheses		Mean Escapement (1991– 2002)
520 (1.0*)	330 (1.6*)	159**

**Note: Productivity is expressed as adults produced per spawner*
***Note: Includes supplemental hatchery production*

There is a concern that this interim objective for Jimmycomelately Creek summer chum may represent a moderate risk to extinction using the methods of Allendorf et al (1997). However, Allendorf's assumptions were theoretical, and a population may be viable at sizes slightly below those he predicted. Additionally, these interim targets are based upon observed escapements during the 1970's and early 1980's. It is entirely possible that the population was already in decline by that time, as significant habitat alteration to the creek began in the late 1800's. Finally, it may be that the Jimmycomelately Creek stock is part of a larger population that included the Dungeness River and/or Discovery Bay stocks.

Step 3. Action Identification: Identify the habitat, harvest, and hatchery management actions necessary to attain the planning targets. The target date for completion of this step is June 4, 2004.

Status –

Dungeness Chinook: The DRMT conducted an extensive review (1997) of factors limiting chinook production in the Dungeness River. This review was conducted at a reach level, and was based upon what has been termed "*The Seven Pillars of Restoration*" for the Dungeness River:

1. Reestablish functional channel and floodplain in the lower 2.6 miles through dike management and constriction abatement.
2. Abate man-made constrictions upstream of the Corps dike (everything above RM 2.6).
3. Create numerous stable, long-term log jams.
4. Manage sediment to stabilize the channel and reduce the risk of flooding.
5. Construct and/or protect side channels.
6. Restore suitable riparian vegetation and riparian-adjacent upland vegetation.
7. Conserve instream flows.

For each of these "*seven pillars*" a list of projects has been identified for each reach of the river. Additional projects were recommended in the "Salmon and Steelhead Habitat Limiting Factors for WRIA 18" (WSCC, 2000) and the "Draft Dungeness River Comprehensive Flood Hazard Management Plan" (Clallam County, 2003). These projects have further been ranked in a prioritized list, which is included in the NOPLE recovery strategy (NOPLE, 2001). In addition to these completed reports, it is anticipated that the results of the "2514" Watershed Planning process and the CIDMP process will include recommendations regarding water use, instream flows, water quality, and the operation and maintenance of the various irrigation systems on the river which will maintain or improve salmon habitat in the river.

The co-managers have developed harvest and hatchery management strategies targeting the recovery of Dungeness Chinook. The interim harvest management objective is simply to ensure that the harvest rate for Dungeness Chinook in "Southern U.S." (SUS) waters does not exceed 10% of the total run (WDF&W and Puget Sound Tribes, 2001), unless spawning ground escapement is predicted to fall below 500 fish, in which case a suite of additional fisheries restrictions apply. In this case, "Southern U.S." waters are defined as all marine waters of the Pacific Coastal U.S., south of the U.S./Canada border. The provisions of the U.S./Canada Pacific Salmon Treaty control harvest north of the U.S./Canada border. The hatchery objectives are described in "Dungeness Chinook Salmon Rebuilding Project: Project Report 1993- 1998" (Marlowe et. al., 2001) along with the State's Hatchery Genetic Management Plan (HGMP) (WDF&W, 2002) which was required by NOAA Fisheries to ensure compliance with ESA.

Elwha Chinook: The participants in the EREFRA process identified fish passage through the two dams on the Elwha River as the primary factor limiting chinook production on the Elwha River. During the EIS process (DOI, 1995), a "no action" alternative (leave dams in place) was considered, along with options to leave one or the other dam in place, or remove both dams. It was determined that only the option of removing both dams would ensure the full restoration of salmon stocks in the river. At this time, the Dept. of Interior has purchased both dams, and efforts are underway to begin removing the dams in 2007. Congress has currently funded approximately $122 million of the $182 million needed to implement dam removal.

In addition to dam removal, the fisheries restoration plan drafted by EREFRA participants includes a series of habitat restoration projects that were based upon an evaluation of limiting factors in the river. The draft WRIA 18 Watershed Plan (WRIA 18 Initiating Governments, 2003 Draft), as well as the Salmon and Steelhead Habitat Limiting Factors for WRIA 18 (WSCC, 2000), identify additional habitat projects which should be implemented to ensure recovery of Elwha Chinook. Finally, the WRIA 18 Watershed Plan suggests evaluating minimum flow requirements necessary for salmon recovery planning, following dam removal, and the creation of a Habitat Conservation Plan for the water supply actions.

The co-managers have identified hatchery and harvest actions necessary for the long-term recovery of Elwha Chinook. The interim harvest management goal is identical to the Dungeness goal (not to exceed 10% SUS harvest rate, except below 500 fish) (WDF&W and Puget Sound Tribes, 2001), while the hatchery objectives are included in the State's HGMP (WDF&W, 2002). The EREFRA process has also produced a draft stocking plan, to ensure chinook adequately distribute themselves throughout the watershed following dam removal, and made recommendations regarding terminal area harvests. It should be noted that this plan was originally created prior to the listing of chinook under ESA, and is currently being modified to incorporate ESA standards.

Morse Creek Chinook: The Salmon and Steelhead Habitat Limiting Factors for WRIA 18 (WSCC, 2000) identified a list of factors contributing to the decline and failure of the Morse Creek chinook stock, along with suggested measures to recover all salmon populations in the river. In addition, the draft WRIA 18 Watershed Plan (WRIA 18 Initiating Governments, 2003 Draft) contains a series of recommendations that also target the general recovery of salmon. However, no significant efforts have yet been made by the co-managers or other planning efforts to systematically consider a method for restoring a naturally spawning population of chinook to this watershed.

Summer Chum Salmon: The "Summer Chum Salmon Conservation Initiative" (Initiative) (WDF&W and the PNPTC, 2000) contains an extensive review of factors limiting production of summer chum throughout their range in Hood Canal and the Strait of Juan de Fuca. The Initiative describes a "tool kit" of protection/restoration strategies to address primary habitat features in freshwater (flow, water quality, channel complexity/floodplain, sediment, riparian forest, fish access/passage) as well as the estuarine and nearshore environment. The Initiative also contains a priority list of

activities which should be undertaken on a stream-by-stream basis, including both the Dungeness River and Jimmycomelately Creek stocks.

In conjunction with the analysis in the Initiative, the Jamestown S'Klallam Tribe (2000), along with other project partners, developed a plan to restore the habitat within Jimmycomelately Creek. This plan addresses all of the primary habitat features described in the Initiative through a complex series of activities which include constructing a new stream channel, removal of roads within the estuary, construction of a bridge along Hwy 101 for the new channel, and removal of other features within the nearshore environment which are affecting the area's tidal prism. At this time, the project is nearing completion, although several key activities slated for the nearshore environment are as yet unfunded.

In addition to these habitat actions, the co-managers have identified harvest and hatchery measures targeting the recovery of Jimmycomelately summer chum (WDF&W and PNPTC, 2003). These actions include assuring that the harvest rate does not exceed the level required to achieve the recovery goals (~30% maximum harvest rate) and supplementing the run with hatchery production until such time that the habitat in the river is capable of supporting natural production at the levels outlined in the interim goals.

Other Actions: Broad scale local, State, and Federal land-use management actions targeting improvement of environmental conditions are also underway, independent from recovery planning efforts for the local watersheds. These efforts include such items as the Growth Management Act, the State "Fish and Forest" Plan, the Federal Northwest Forest Plan, the Dept. of Natural Resources Habitat Conservation Plan, the Dungeness Watershed Analysis, the State hydraulics code, and local (county/city) codes and ordinances. Each of these efforts contains recommendations regarding such items as riparian zone buffers, water quality standards, road construction and maintenance, etc. Although the standards in each plan are not consistent, they each have the objective of providing for land use, while protecting the conditions of the watershed. However, for the purposes of recovery planning, it will be critical to analyze the expected results of each action towards achieving the stated recovery goals for each listed stock in Clallam County. This can be done through the EDT model, or alternative modeling methods.

Clallam County, in *Towards Recovery* (Clallam County, 2001), completed an evaluation of the local ordinances and planning activities using the following 12 principles, developed by NOAA Fisheries to be applied to development planning:

1. Avoid inappropriate areas such as unstable slopes, wetlands, areas of high habitat value, and similarly constrained sites.
2. Avoid stormwater discharge impacts to water quality and quantity or to the hydrograph of the watershed.
3. Require adequate riparian buffers around all perennial and intermittent streams, lakes or wetlands.

4. Avoid stream crossings by roads wherever possible, and where one must be provided, minimize impacts through choice of mode, sizing and placement.
5. Protect historic stream meander patterns and channel migration zones; avoid hardening of stream banks.
6. Protect wetlands and wetlands functions.
7. Preserve the hydrologic capacity of any intermittent or permanent stream to pass peak flows.
8. Landscape to reduce need for watering and application of herbicides, pesticides and fertilizer.
9. Prevent erosion and sediment runoff during construction.
10. Assure that water supply demands for the new development can be met without impacting flow needed for threatened salmonids either directly or through groundwater withdrawals, and that any new water diversions are positioned and screened in a way that prevents injury or death of salmonids.
11. Provide all necessary enforcement, funding, reporting, and implementation mechanisms.
12. The development complies with all other state and Federal environmental or natural resource laws and permits.

Step 4. Regional Recovery: Determine which set of options in individual watersheds will add up to recovery at the regional scale, the scale at which chinook salmon, summer chum, and bull trout are listed under the ESA. Work on this task will begin in earnest July 1, 2004.

Status - For the Dungeness and Elwha chinook stocks, as well as for Hood Canal summer chum populations in the County, a limited review of harvest and hatchery management practices has been completed at the regional level. However, at this time no comprehensive assessment of habitat measures has been taken. At the watershed level, the DRMT plans to complete the "treatment" phase of the EDT model, in order to assess the suitability of a suite of recovery actions to achieve the stated goals for the stock. For the Elwha watershed, no assessment is planned until after the two dams on the river have been removed, as that action represents both the single most important action to achieve recovery as well as the largest short-term impact to the system.

Step 5. Finalize Plan: Finalize an initial set of recovery goals and management actions consistent with treaty rights and the ESA. The target date for completion of this task is June 30, 2005.

Status – Although a suite of actions is being considered in the various planning efforts within the Dungeness and Elwha watersheds, no attempt has been made to assemble these actions into a single plan.

V. Coordination of Efforts

A. Existing Coordination of Efforts

Successful planning will require the coordination of all efforts targeting salmon recovery to ensure conformity of recovery goals, efficiency of process, and identification of conflicting efforts or objectives. Coordination will also be necessary to effectively evaluate the suite of efforts against the overarching objective of achieving VSP, prior to acceptance of the recovery plan by NOAA Fisheries and the USF&WS. Appendix B provides a summary of communication links between each forum.

The 2514 Watershed Planning forums are the most comprehensive efforts within the County. In particular, the DRMT has assembled a group of stakeholders who generally represents the interests and demographics of the watershed. Active participants in the DRMT include the Jamestown S'Klallam Tribe, Clallam County, City of Sequim, U.S. Forest Service, WA Dept. of Ecology, WA Dept. of Fish and Wildlife, US Fish and Wildlife Service, North Olympic Land Trust, Dungeness Water Users Association, Clallam Conservation District, environmental organizations, property owner groups, and private citizens. This broad array of individuals and organizations helps ensure that recovery planning for the Dungeness watershed is broadly supported.

The DRMT and EMMT (the two 2514 planning efforts) are loosely linked to each other through the Elwha-Dungeness Coordinating Council (EDCC or "Initiating Governments"). The Initiating Governments meet regularly to discuss issues of common interest between the two groups, as well as to attend to administrative matters. DRMT and EMMT are more strongly linked to the NOPLE process, as each group provides for representation to NOPLE through a Citizen's Facilitation Group. Further, the Lead Entity Group for NOPLE is comprised of representatives from a number of the same local governments that form the Initiating Governments for the 2514 watershed planning process, so there is continuity in the policy direction for the two forums. Similarly, a number of the participants in the Marine Resource Committee also participate in NOPLE and/or the watershed planning forums.

B. Missing Coordination Elements

Although the 2514 watershed planning forums (in particular, DRMT) and the NOPLE process could form the heart of the salmon recovery planning effort in Clallam County, not all forums are currently well coordinated into a salmon recovery planning process as envisioned by Shared Strategy. In particular, restoration planning for the Elwha River watershed has been developed largely through the work of the EREFRA project partners, with minimal effort by EMMT to specifically incorporate the recovery goals identified by EREFRA into their watershed planning efforts.

There is a general recognition that dam removal represents the primary action needed to fully restore salmon runs to the Elwha River. However, recovery planning associated with dam removal has not yet been fully incorporated into a broader ESA-specific

watershed recovery plan. This may be due to the fact that dam removal is a federally administered project conducted on federal lands, leading other local partners to believe that planning for dam removal can be isolated from planning in the watershed outside the jurisdiction of the Elwha Act. This is not the case.

Unless planning targets developed by the EREFRA participants (or alternative planning targets), are incorporated into other planning forums (EMMT, Harvest, Hatchery), then it will not be possible to draft the ESA recovery plan envisioned by Shared Strategy. For example, those involved in water use planning through EMMT should have a shared vision for what constitutes recovery with EREFRA. Otherwise, low flow conditions could hamper full achievement of the EREFRA goals. Even among WDF&W (and to a lesser extent Tribal) staff, there has been a lack of communication regarding objectives developed by EREFRA and those being considered in other forums (hatchery and harvest primarily). Further, key drainages within the Elwha Watershed (Indian Creek and Little River) are not directly considered by the EREFRA process, and yet may be important to fully achieving the stated recovery goals.

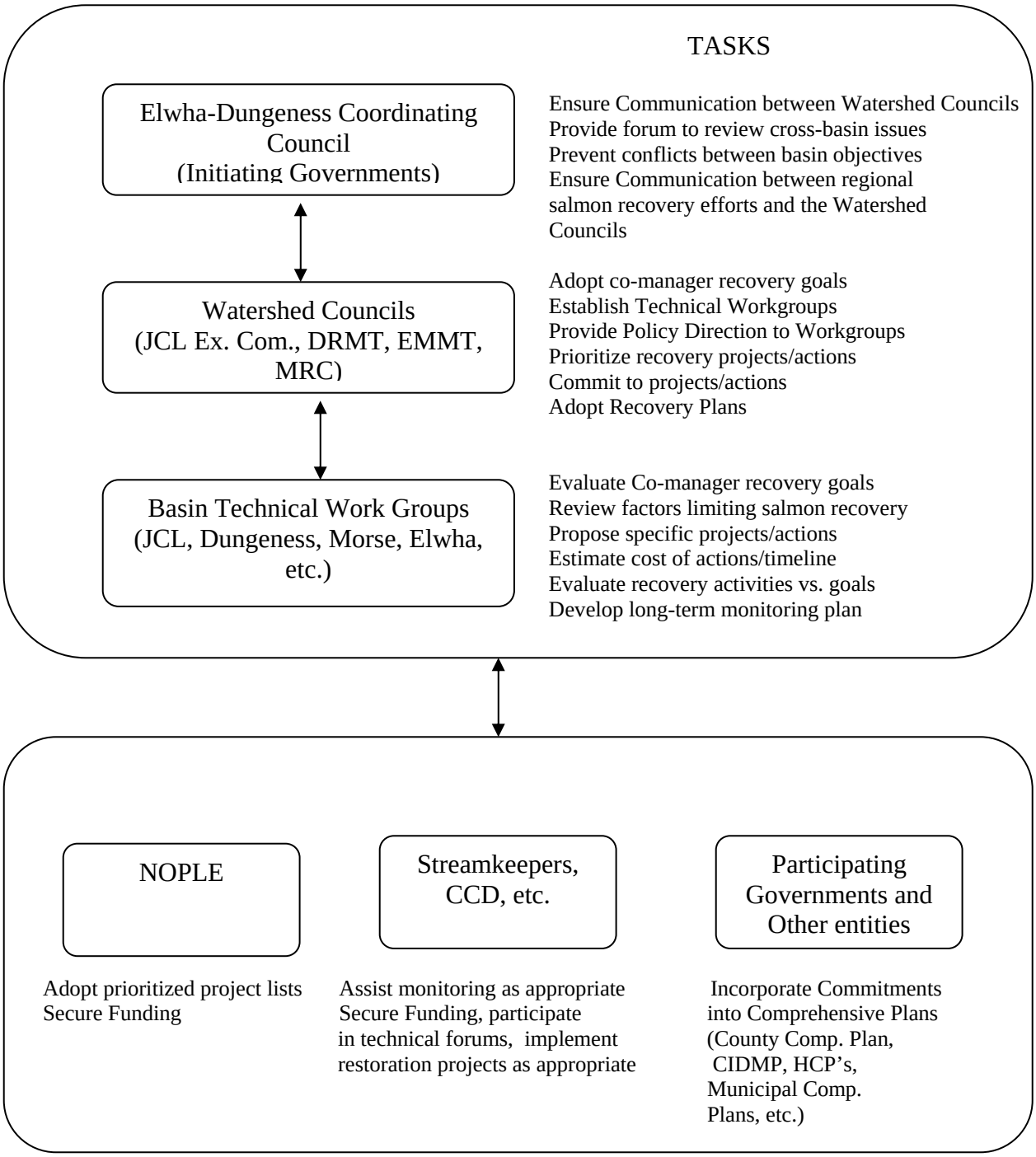
The MRC could also be better coordinated with individual watershed recovery efforts. The EDT analyses performed on both the Dungeness and Morse Creek watersheds indicate that the estuarine area is a critical component in the recovery of these stocks. The Clallam County MRC is a potential resource for addressing these issues, but to this point, has not been fully engaged in recovery discussions. The MRC does serve as one of the Citizen Facilitation Groups for the NOPLE process, but they have not been active in recovery planning.

Finally, the majority of recovery planning efforts within Clallam County have focused on chinook and summer chum salmon. Bull trout are being considered in the DRMT and EMMT, EREFRA, and CIDMP processes. However, the extent to which bull trout have been considered varies between forums and has uniformly played a diminished role to planning for chinook and summer chum salmon. In order to fully achieve the objectives of Shared Strategy, bull trout will need to be specifically considered to the same extent as other listed species (i.e. bull trout-specific recovery goals and actions).

C. Proposed Communication Pathway

In general, recovery planning within Eastern Clallam County has focused on each individual watershed (Jimmycomelately Creek, Dungeness River, Siebert Creek, Ennis Creek, Valley Creek, Elwha River, etc.), with very little communication between watershed efforts. Even within watersheds, key recovery activities may not be coordinated. Additionally, the nearshore component of recovery planning has generally received less consideration than the freshwater component, even though the estuarine environment has been identified as a critical element of any recovery plan. Using the DRMT as a model forum, a slight revision to the existing efforts is suggested in order to increase coordination within and between watershed planning efforts (Figure A).

Figure A.
Proposed Communication Pathway
For Salmon Recovery Planning
In Clallam County



Elwha-Dungeness Coordinating Council ("Initiating Governments")

Under the proposed organizational structure, the Elwha-Dungeness Coordinating Council (EDCC) would modify its role to serve as a blanket forum for all salmon recovery planning processes in the Eastern Clallam County. Within the context of recovery planning, the EDCC would ensure communication between the various watershed planning processes and between these processes and the regional recovery planning efforts, provide a forum to review cross-basin issues, and prevent conflicts between basin objectives. In order to complete these tasks, the EDCC needs to:

- Incorporate all relevant local, State, and Federal government agencies
- Commit to specifically addressing salmon recovery planning in the context of the Shared Strategy process
- Incorporate the MRC or otherwise include the nearshore and estuarine restoration component into recovery planning

Planning for recovery of Morse Creek chinook can serve as an example for how the EDCC might serve its envisioned role. As the original Morse Creek chinook stock appears to be extirpated, a decision must be made regarding the means by which another stock would be introduced to the system. Three obvious choices exist: 1) allow natural recolonization; 2) introduce Dungeness chinook; 3) introduce Elwha chinook. Each choice has the potential to affect recovery efforts in both the Dungeness and Elwha watersheds. Therefore, even though EMMT (or a Morse Creek watershed planning council) would develop the specific details of a recovery plan, the EDCC can serve as a forum for the DRMT and EMMT to meet to discuss common interests/concerns regarding the plan.

Another example of where recovery planning could benefit from the EDCC can be found in the USF&WS Biological Opinion (2000) regarding impacts of Elwha dam removal on bull trout. The USF&WS has required the Olympic National Park to conduct a genetic analysis of the Lower Dungeness River/Gray Wolf River sub-population, in order to properly consider relocation options for Elwha bull trout during the period of dam removal. The EDCC could serve as a forum to share this information to ensure that these efforts are not duplicated by the DRMT.

Watershed Councils

Under the umbrella of the EDCC, the various watershed councils (like DRMT, EMMT, etc.) would be responsible for the actual drafting and adoption of watershed recovery plans. The tasks of these watershed councils would be to adopt recovery goals, establish and coordinate technical work groups, prioritize recovery actions/activities, commit to specific actions/activities necessary for recovery, and adopt a recovery plan. In most cases, the existing forums are fully capable of completing these tasks. In fact, the DRMT, EMMT, and JCL Executive Committee have completed significant portions of what might be incorporated into a "recovery plan".

DRMT –

The DRMT is a well organized watershed council, and is currently fully engaged in most of the tasks described above. Under this proposed process, the DRMT would:

- Work more closely with the MRC to develop the nearshore and estuarine recovery component.
- Improve existing integration of Habitat issues with the Hatchery and Harvest components of a recovery plan.
- Carefully consider build-out/land use planning effects on recovery efforts in order to incorporate the 20-, 50-, and 100-year planning horizons suggested by NOAA Fisheries.
- Develop a monitoring plan to evaluate the success of the recovery plan to achieve stated goals.

EMMT (Elwha Watershed) –

The EMMT process has made remarkable steps within the past several years in organizing and assembling a "2514" watershed plan. Although EMMT identified habitat as a component of their planning efforts, they have not yet taken on recovery planning to the extent that the DRMT has. More importantly, EMMT and EREFRA have not effectively worked together in a way that could produce a comprehensive basin recovery plan. It is proposed that to create a recovery plan for the Elwha watershed:

- The EMMT and EREFRA processes need to identify a cooperative process which can create the recovery plan envisioned by Shared Strategy.
- A commitment must be made by the participants to engage in recovery planning, as envisioned by the Shared Strategy.
- The participants must formally adopt recovery goals.
- A systematic review is needed of other factors, beyond the two dams on the Elwha river, which may affect recovery planning
- A technical committee should be created which looks at issues beyond dam removal, similar to the DRMT River Restoration Workgroup.
- Improve existing integration of Habitat issues with the Hatchery and Harvest components of a recovery plan.
- Carefully consider build-out/land use planning effects on recovery efforts in order to incorporate the 20-, 50-, and 100-year planning horizons suggested by NOAA Fisheries.
- Develop a monitoring plan to evaluate the success of the recovery plan to achieve stated goals.

EMMT (Morse Creek Watershed) –

Recovery planning for the Morse Creek watershed should similarly be developed. However, in the case of Morse Creek, there is only minimal work upon which to build.

The initial action needed is a commitment of potential partners to embark upon a specific effort to restore chinook to Morse Creek. Once this commitment is made, then recovery planning can proceed as outlined for the other watershed councils.

Jimmycomelately Creek Executive Committee –

Efforts to recover summer chum on Jimmycomelately (JCL) Creek are fully functioning. The JCL Executive Committee should continue on the track that they have begun. The only modifications suggested would be to:

- Incorporate the co-manager's recovery goals into existing planning efforts.
- Work more closely with the MRC to expand upon the nearshore and estuarine restoration efforts.
- Work cooperatively with the Hood Canal Coordinating Council, to ensure consistency with other efforts to recover summer chum.
- Carefully consider build-out/land use planning effects on recovery efforts in order to incorporate the 20-, 50-, and 100-year planning horizons suggested by NOAA Fisheries.

Clallam County Marine Resource Committee –

The Clallam County Marine Resource Committee (MRC) has been functioning effectively in its capacity for several years. To date, its efforts have been focused on general issues of importance to the marine environment, without a specific desire to engage in salmon recovery planning. Under this proposal, the MRC would be asked to:

- Formally engage in salmon recovery planning efforts.
- Assist NOPLE and the watershed councils in developing a prioritized list of nearshore projects/actions that could be incorporated into a recovery plan.

Other Forums –

Under this vision for creation and implementation of a salmon recovery plan for Eastern Clallam County, the North Olympic Peninsula Lead Entity Group, Streamkeepers of Clallam County, and the appropriate participating governments would serve as the vehicles by which the various local components of the plan could be implemented. NOPLE would seek to secure funding for prioritized projects. Streamkeepers could assist in monitoring as appropriate, as well as help to secure funding for specific monitoring tasks. Finally, the participating governments would incorporate commitments into their local codes, ordinances, and/or operating procedures as appropriate.

VI. Conclusions

Efforts to recover listed stocks of salmon in Clallam County are well developed. Recovery goals have been identified for chinook and summer chum populations, and key

elements are being implemented within the Jimmycomelately Creek, Dungeness, and Elwha watersheds to achieve these recovery goals. Specific projects include:

- Recreation of the historic Jimmycomelately Creek flood plain and estuary
- Supplemental production of the JCL summer chum stock to preserve the population while habitat restoration efforts are underway.
- Identification of habitat restoration projects within the Dungeness watershed
- Implementation of several of the identified projects, including acquisition of property within the estuary.
- Implementation of a water conservation/instream flow agreement in the Dungeness watershed.
- Supplemental production of the Dungeness chinook stock to ensure preservation while habitat restoration efforts are underway.
- Planning for removal of two dams on the Elwha River (with removal scheduled to begin in 2007).
- Enhancement of the Elwha chinook stock to ensure preservation while dam removal is underway.

Although the groundwork for the development of successful recovery planning is laid, key elements must yet be addressed. These elements include:

- A commitment by the partners within each watershed to develop a recovery plan as envisioned by the Shared Strategy process.
- Increased emphasis on Bull Trout restoration planning.
- Continued funding to coordinate restoration planning and draft watershed plans.
- Continued funding to implement critical elements of restoration planning
- Increased communication between watershed planning efforts, to prevent conflicts between basin objectives.
- Increased coordination between local and regional recovery planning efforts
- Increased coordination with nearshore and estuarine recovery planning efforts.
- Increased coordination between Elwha River dam removal planning and other local recovery planning efforts.
- A clear incorporation of a long-range vision for recovery planning (20-, 50-, and 100-year planning horizon).

In order to implement this proposal, the local governments and other relevant organizations and agencies must make a commitment to proceed with this type of planning effort. The DRMT made such a commitment in a letter to William Ruckelshaus (Shared Strategy Development Committee Chair) dated December 11, 2002. Clallam County similarly committed to working with the Shared Strategy in a letter to Mr. Ruckelshaus dated March 19, 2003. However, other affected governments have not yet committed to this cooperative planning effort. This lack of commitment may be related to the fact that time and effort has been focused on the completion of the 2514 Watershed Plan, that there is insufficient local understanding of the Shared Strategy process, or a simple unwillingness to get involved in “yet another planning forum”.

The County will present this document to the EDCC, EMMT, DRMT, MRC, NOPLE, and the Olympic National Park, in an attempt to garner support for the recovery planning strategy outlined. In the event that this strategy does not seem practical or acceptable to the affected parties, then the County should work with the local governments and stakeholders to identify an alternative means of producing recovery plans.

The County should also work with the existing local recovery planning efforts to assemble an itemized list of all projects that are currently identified as essential to chinook, summer chum and bull trout recovery, along with a cost estimate for those activities, with the intent of supplying the list to WDF&W, *The Shared Strategy for Puget Sound*, and NOAA Fisheries by June, 2004. This work should specifically include an effort to fully answer the following questions, posed to the recovery planners throughout Puget Sound by the staff for the Shared Strategy, by the deadline date identified for each question:

By November 6th, 2003:

What are the major physical and biological changes necessary for you to achieve your planning targets (viable populations), and what are some of the policy implications of those changes?

2. How does your answer to question 1 influence your thought process about what your watershed goal will be?

3. What technical and policy questions and issues does your initial analysis raise?

By June 30, 2004

1. The watershed's vision: what is the future you want to create for people and salmon in their watershed?

2. The watershed's quantifiable goals for fish populations and marine nearshore habitat?

3. What are the suites of actions it will take to achieve the vision and goals?

4. What is the technical rationale for your goals and suite of actions?

5. What are the costs for the suite of actions?

6. What commitments will be needed to implement the suite of actions?

Appendix A

Characteristics of a Viable Salmonid Population (VSP)
(from **Integrated Recovery Planning for Listed Salmon:**
Technical Guidance for Watershed Groups in Puget Sound

Puget Sound Technical Recovery Team and Shared Strategy Staff Group
Draft February 3, 2003)

McElhany et al. (2000) provided a conceptual basis for salmonid conservation assessments, identified four key characteristics of a population, and described their role in maintaining population viability:

Abundance is recognized as an important parameter because, all else being equal, small populations are at greater risk of extinction than large populations, primarily because several processes that affect population dynamics operate differently in small populations that they do in large populations. These processes are deterministic density effects, environmental variation, genetic processes, demographic stochasticity, ecological feedback, and catastrophes.

Population growth rate (i.e., productivity over the entire life cycle) and factors that affect population growth rate provide information on how well a population is "performing" in the habitats it occupies during the life cycle. Estimates of population growth rate that indicate a population is consistently failing to replace itself are an indicator of increased extinction risk. Although our overall focus is on population growth rate over the entire life cycle, estimates of stage-specific productivity – particularly productivity during freshwater life-history stages – are also important to comprehensive evaluation of population viability. Other measures of population productivity, such as intrinsic productivity and the intensity of density-dependence may provide important information for assessing a population's viability. The guidelines for population growth rate are closely linked with those for abundance.

Spatial structure must be taken into account for two reasons: 1) Because there is a time lag between changes in spatial structure and species-level effects, overall extinction risk at the 100-year time scale may be affected in ways not readily apparent from short-term observations of abundance and productivity, and 2) population structure affects evolutionary processes and may therefore alter a population's ability to respond to environmental change. Spatially structured populations in which "subpopulations" occupy "patches" connected by some low to moderate stray rates are often generically referred to as "metapopulations". A metapopulation's spatial structure depends fundamentally on habitat quality, spatial configuration, and dynamics as well as the dispersal characteristics of a population.

Diversity exists within and among populations, and this variation has important effects on population viability. In a spatially and temporally varying environment, there are three general reasons why diversity is important for species and population viability. First, diversity allows a species to use a wider array of environments that they could without it. Second, diversity protects a species against short-term spatial and temporal changes in the environment. Third, genetic diversity provides the raw material for surviving long-term environmental change.

Appendix B

Dungeness and Elwha Basins
Salmon Recovery Planning Efforts
(NOTE: See Definitions/Acronyms in Appendix C)

Forum	Target Issues	Key Salmon Issues	Missing Elements	Identified Links	Missing Links
Dungeness River Management Team	Flood Management	Habitat (flows, quality,	Harvest	EMMT (limited)	Harvest
(DRMT)	Habitat Restoration	hydrology, land use)	Hatchery	CIDMP	Comp Plan
	Water Quality	Integration	Integration with Harvest and	NOPLE	SK
	Water Quantity	Hatchery (limited to restoration	Hatchery	Comp Plan (limited)	MRC
	Instream Flow	planning)		Hatchery (limited)	EREFRA
	Salmon and Wildlife Restoration	Assessment		SFG (limited)	
	Land Use Planning				
	Cooperative Management Planning				
	Implementation of 2514				
	Habitat Restoration Recommendations				
	Public Education				
Elwha-Morse Management Team	Implementation of 2514	Habitat (flows, quality,	Harvest	DRMT (limited)	MRC
(EMMT)	Water Quantity Recommendations	hydrology, land use);	Hatchery	NOPLE	Harvest
	Water Quality Recommendations	Integration (limited discussion	Detailed Integration	EREFRA (limited)	Hatchery
	Habitat Recommendations	on watershed management)	Assessment	Comp Plan (limited)	Comp Plan
	Instream Flow Recommendations			SFG (limited)	CIDMP
	Land Use Recommendations				SK
	Watershed Management Recommendations				
	Habitat Restoration Recommendations				
Clallam Marine Resource Committee	Develop Marine Protected Areas	Habitat (nearshore)	Harvest	NOPLE	DRMT
(MRC)	Net gain in productive nearshore, intertidal,	Integration (limited to nearshore	Hatchery	Comp Plan (limited)	EMMT
	and estuarine habitat	issues)	Detailed Integration	EREFRA (limited)	Comp Plan
	Net reduction in shellfish harvest areas		Assessment	Fisheries (limited)	Hatchery
	closed due to contamination				SFG
	Improvement in bottomfish and forage				SK
	fish habitat				CIDMP
	Data Coordination				
	Public Education				

Forum	Target Issues	Key Salmon Issues	Missing Elements	Identified Links	Missing Links
Comprehensive Irrigation District	Compliance with ESA for Irrigation District	Habitat (water quantity, water	Harvest	DRMT	EMMT
Management Plan	Activities	quality)	Hatchery	SK (limited)	Comp Plan
(CIDMP)	Water for Irrigation	Integration (limited)	Detailed Integration		EREFRA
	Maintenance of Irrigation Infrastructure		Assessment		Harvest
					Hatchery
					MRC
					NOPLE
					SFG
North Olympic Peninsula	Identification of Salmon Habitat Restoration	Habitat	Harvest	DRMT	Harvest
Lead Entity Group	Projects	Assessment (limited)	Hatchery	EMMT	Hatchery
(NOPLE)		Integration (limited)		MRC (limited)	Comp Plan
				EREFRA (limited)	CIDMP
				SFG	
				SK (limited)	
Elwha River Ecosystem and	Restore Elwha River Ecosystem and	Habitat (limited)	Detailed Habitat	MRC (limited)	Comp Plan
Fisheries Restoration Act	Fisheries	Harvest (limited)	Detailed Harvest	EMMT (limited)	EMMT
(EREFRA)	Remove dams on the Elwha River	Hatchery (limited)	Detailed Hatchery	Hatchery (limited)	SFG
	Provide existing water quality to water users	Integration (limited)	Detailed Integration	Harvest (limited)	SK
	Provide existing flood protection to basin	Assessment		NOPLE (limited)	DRMT
	residents				CIDMP
Land Use Planning	Provide for community growth consistent	Habitat	Harvest	EMMT (limited)	MRC
(Comp. Plan)	with community values.	Integration (limited)	Hatchery	DRMT (limited)	CIDMP
			Detailed Integration	EREFRA (limited)	NOPLE
			Assessment		EREFRA
					Harvest
					Hatchery
					SFG
					SK
Co-Managers Annual Fisheries	Provide salmon harvest opportunity while	Harvest	Habitat	DRMT (limited)	EMMT
Planning Forums	protecting weak stocks.	Hatchery		EREFRA (limited)	MRC
(Harvest)	Achieve compliance with ESA	Integration (limited)		Hatchery	CIDMP
	Establish recovery targets	Assessment			NOPLE
					Comp Plan
					SFG
					SK

Forum	Target Issues	Key Salmon Issues	Missing Elements	Identified Links	Missing Links
Co-Managers Annual Hatchery	Support salmon harvest opportunity	Harvest	Habitat	Harvest	EMMT
Planning Forums	Assist in recovery of weak stocks	Hatchery		DRMT (limited)	MRC
(Hatchery)	Achieve compliance with ESA	Integration (limited)		EREFRA (limited)	CIDMP
		Assessment			NOPLE
					Comp Plan
					SFG
					SK
Stream Focus Groups	Improve environmental conditions in	Habitat	Harvest	DRMT (limited)	MRC
	specific watersheds to support	Integration (limited)	Hatchery	EMMT (limited)	EREFRA
	evironmental health and/or recreational	Assessment		NOPLE	Comp Plan
	enjoyment.			SK	Harvest
					Hatchery
					CIDMP
Streamkeepers of Clallam County	Provide monitoring services for interested	Assessment	Harvest	DRMT (limited)	MRC
(Streamkeepers)	parties.	Integration (limited)	Hatchery	EMMT (limited)	Comp Plan
	Public Education		Habitat	CIDMP (limited)	Harvest
	Facilitate watershed stewardship		Integration	NOPLE (limited)	Hatchery
				SFG	EREFRA

Appendix C
Definitions/Acronyms

Acronym	Definition
2496	ESHB 2496 - Salmon Recovery Planning Act
2514	ESHB 2514 - Watershed Management Act
AFW	Agriculture, Fish and Wildlife
CIDMP	Comprehensive Irrigation District Management Plan
Co-managers	The Washington Dept. of Fish and Wildlife and the local Tribes
DOI	United States Department of Interior
DRMT	Dungeness River Management Team
EDCC	Elwha Dungeness Coordinating Council - Initiating Governments
EDT	Ecosystem Diagnostic and Treatment Model
EIS	Environmental Impact Statement
EMMT	Elwha-Morse Management Team
EREFRA	Elwha River Ecosystem and Fisheries Restoration Act (P.L. 102-495)
ESA	Endangered Species Act
ESHB	Engrossed Substitute House Bill
ESU	Evolutionary Significant Unit
FERC	Federal Energy Regulatory Commission
Initiating Governments	Those governments involved in initiating watershed planning under 2514
Initiative	Summer Chum Salmon Conservation Initiative
JKST	Jamestown S'Klallam Tribe
LFA	Limiting Factors Analysis
MRC	Clallam County Marine Resource Committee
NOAA Fisheries	National Oceanographic and Atmospheric Administration - Fisheries Div.
NOPLE	North Olympic Peninsula Lead Entity, established under 2496
NOSC	North Olympic Salmon Coalition
NSMCC	Northwest Straits Marine Conservation Commission
PNPTC	Point No Point Treaty Council
Shared Strategy	Shared Strategy for Puget Sound
State	Washington State
Streamkeepers	Streamkeepers of Clallam County
SUS	"Southern United States" Pacific waters south of US/Can border
TRT	Puget Sound Technical Recovery Team
USDA	United States Department of Agriculture
USF&WS	United States Fish and Wildlife Service
VSP	Viable Salmon Population
WDF&W	Washington Department of Fish and Wildlife
WRIA 18	Watershed Resource Inventory Area 18 (Dungeness-Elwha Watersheds)
WSCC	Washington State Conservation Commission
WWTIT	Western Washington Treaty Indian Tribes

Appendix D
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