

Comprehensive Tribal Natural Resource Management



An Annual Report from the
Treaty Indian Tribes in Western Washington
2007

Member Tribes of the Northwest Indian Fisheries Commission



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Cover: Quileute tribal fishermen Kevin Penn and Zach Cleveland haul in a crab pot off the Washington coast near LaPush.
 Photo: Debbie Preston, NWIFC • Map: Ron McFarlane, NWIFC



An orca breaches in Puget Sound. Pollution and other environmental factors are threatening marine and fresh water ecosystems throughout the region. *NWIFC: D. Preston*

Introduction

By virtue of their treaty-reserved rights and legal status as co-managers, the treaty Indian tribes in western Washington are key participants in the management of all of the region's natural resources. Because all of these natural resources are interconnected, tribes are committed to a holistic, collaborative conservation approach to stewardship.

Tribes are leaders in wild salmon recovery, forest management, water quality protection and almost every other aspect of natural resource management in western Washington. This report is intended to provide a broad overview of tribal natural resource management activities during Fiscal Year 2006.

The 20 treaty Indian tribes in western Washington provide crucial scientific, cultural and historical perspectives to the cooperative natural resource management processes that epitomize the region. The tribes are strategically located in each major watershed in the region and are able to quickly respond to the needs of those ecosystems, blending thousands of years of traditional knowledge with modern science. Treaty tribes in western Washington are Lummi, Nooksack, Swinomish, Upper Skagit, Sauk-Suiattle, Stillaguamish, Tulalip, Muckleshoot, Puyallup, Nisqually, Squaxin Island, Skokomish, Suquamish, Port Gamble S'Klallam, Jamestown S'Klallam, Lower Elwha Klallam, Makah, Quileute, Hoh and Quinault.

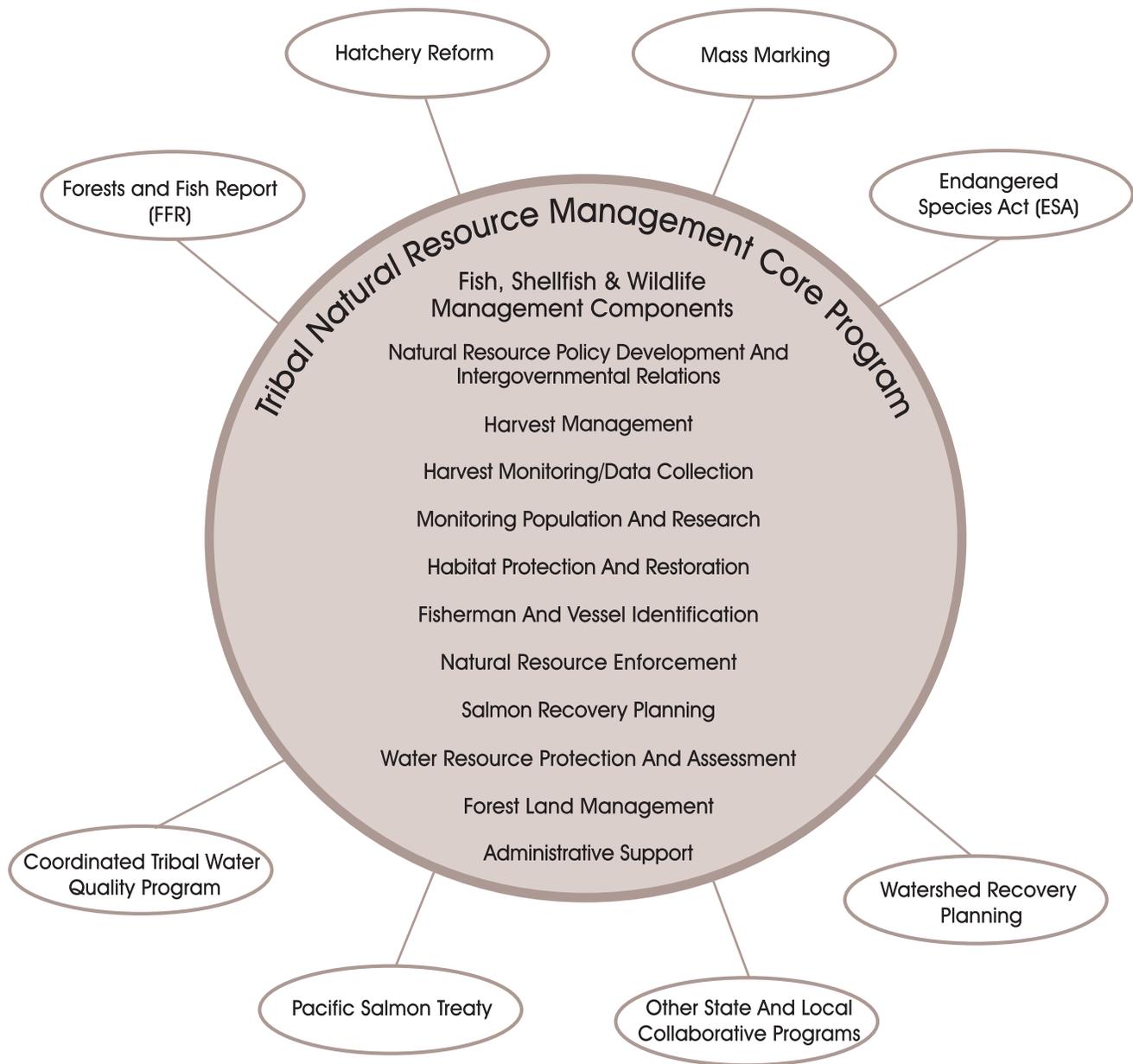
The treaty tribes are daily faced with new natural resource management challenges. Low-oxygen "dead zones" have appeared in Hood Canal and off the Washington coast, killing thousands of fish, crab and other species. Puget Sound is dying from the pressures of millions of new residents expected to double the region's population in the next 20 years. Many miles of in-river salmon spawning and rearing habitat continue to degrade to the point they can no longer support salmon.

The tribes know that the battle to save the natural resources of the region can only be won if everyone works together. In a spirit of cooperative conservation that has prevailed in Washington since the 1980s, tribes partner with governments, agencies, organizations and others to effectively address the needs of the region's natural resources. This management philosophy achieves an economy of scale that enables efficient and effective use of limited funding. The Shared Strategy for Puget Sound Chinook Recovery and the Puget Sound Partnership are two examples of these types of cooperative conservation efforts.

The treaty Indian tribes have always depended on natural resources for their cultural, spiritual and economic survival. There is no stronger ally than the treaty Indian tribes in the effort to effectively preserve, protect and restore these resources.

More information about the natural resource management activities of the treaty Indian tribes in western Washington is available from tribal Web sites and the Northwest Indian Fisheries Commission at www.nwifc.org.

Tribal Natural Resource Management Core Program and Collaborative Initiatives





Coho salmon return to the Salmon River, which flows through the Quinault Indian Nation's reservation on the Washington coast.
NWIFC: D. Preston

Tribal Salmon Management

Indian tribes have always lived on every major watershed in what is now the state of Washington. From time immemorial, tribal cultures, spirituality and economies have centered on fishing, hunting and gathering natural resources in the region.

In the mid-1850s, when the United States sought to make land available for settlement in the region, the tribes signed treaties that reserved what was most important to them. Among those reserved rights was the right to harvest salmon in all of their usual and accustomed fishing places.

The promises of the treaties were broken in the years that followed. When tribal members tried to exercise their treaty-reserved rights, they were jailed and their catches confiscated. In 1974, the promises of the treaties finally were upheld when a federal district court reaffirmed the tribes' reserved rights in *U.S. vs. Washington*, also called the Boldt Decision. The ruling, subsequently upheld by the U.S. Supreme Court, established the tribes and the state of Washington as co-managers of the salmon resource. Since then, tribal fisheries management programs have evolved to fulfill the tribes' co-manager role.

As a sovereign government, each tribe regulates and coordinates its own fishery management program within its usual and accustomed fishing area. Tribal management jurisdiction includes six species of salmon: chinook, coho, chum, pink, sockeye and steelhead. Tribes conduct fisheries off the Washington coast, in coastal rivers and bays, and throughout the inland waters of Puget Sound and its tributaries.

A tribe's salmon management program typically includes a manager who oversees staff working in the areas of harvest management, enhancement and habitat. The fishery manager develops fishery plans and run size forecasts, assesses spawning escapement needs and monitors stock status, among other duties.

Each tribe or tribal natural resource management cooperative maintains enforcement programs to ensure that fishing regulations are observed. Enforcement officers work with state and federal enforcement personnel to protect the resource. Violations of tribal fishing laws are prosecuted in tribal courts.

Tribal salmon management is about managing harvest, hatcheries and habitat – the three H's – in a balance that meets the needs of the resource and those who depend upon it. Restoring all wild salmon populations to self-sustaining levels that can support harvest is the primary salmon management goal of the treaty Indian tribes.

Wild Salmon Recovery

Integration of the H's is the key to wild salmon recovery and the focus of the treaty Indian tribes in western Washington. It means that all three of these primary aspects of salmon management must work together to achieve salmon recovery.

Harvest management must be conservative, protecting weak wild stocks while allowing appropriate harvest of healthy, primarily hatchery-raised salmon. Hatchery practices must protect the genetic integrity and survival of wild salmon stocks while also producing salmon for harvest. Habitat quality and quantity, the primary limiting factors for wild salmon productivity, must be improved to take advantage of gains realized from advancements in harvest and hatchery practices.

More than 30 years ago, state and tribal salmon co-managers began sharply reducing harvest in response to declining wild salmon runs. Today's harvest levels are only 80-90 percent of those in 1985. This overall reduction in salmon harvest has come at great cost to the spiritual, cultural and economic well-being of the treaty Indian tribes. Reducing harvest alone, however, can not compensate for the decrease in natural wild salmon production caused by lost and degraded salmon habitat.

Together, more than 100 tribal, state and federal hatcheries in western Washington comprise the largest hatchery system in the world, producing nearly three-fourths of all the salmon harvested in Puget Sound and playing a critical role in meeting treaty tribal harvest obligations. Through hatchery reform efforts now under way, the treaty tribes and state of Washington are drawing upon state-of-the-art science to minimize the impacts of artificial propagation on wild salmon.

Tribal governments have made strides to protect salmon habitat, both on their reservations through land-use and water resource authorities and off-reservation by collaborating with non-Indian neighbors to protect and restore watersheds that support salmon. Extensive habitat protection and restoration throughout the region is beyond the power of the tribes alone to implement. Only through concerted federal, state, tribal, local and private efforts can this be achieved.

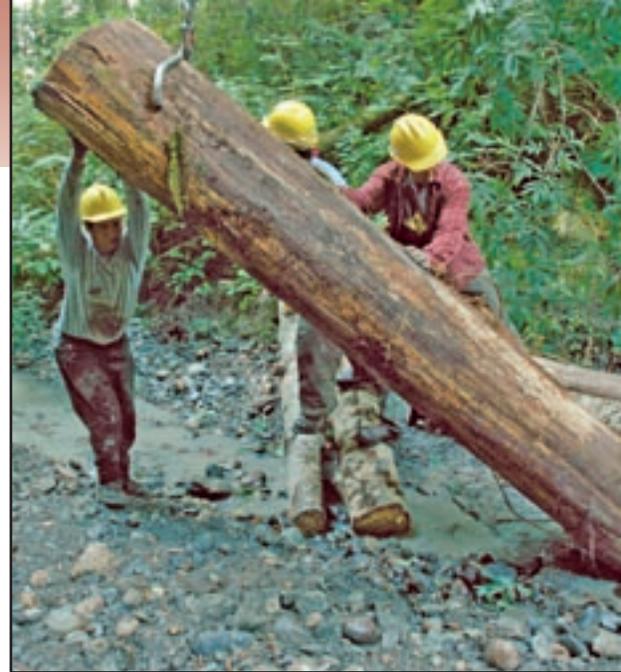
Pacific Coastal Salmon Recovery Fund

One program helping to recover wild salmon in western Washington is the Pacific Coastal Salmon Recovery Fund (PCSRF) established by Congress in FY 00 to aid the conservation, restoration and sustainability of Pacific salmon and their habitats. Congressional appropriations have been made to Pacific Coast and Columbia River Indian tribes, as well as the states of Oregon, Washington, Idaho and Alaska, to aid recovery of weak wild salmon stocks and leverage additional funding and volunteer participation by local and private entities.

PCSRF funding supplements extremely limited tribal resources for salmon recovery efforts. To make each federal funding dollar work to its fullest, tribes leverage PCSRF funding through partnerships with other tribes, local governments, watershed councils, conservation organizations and others.

PCSRF monies are making significant contributions to the recovery of wild salmon throughout the region. Since the program's inception, Pacific coastal tribes, including the 20 treaty tribes in western Washington, have used PCSRF monies to:

- ◆ Remove 79 fish passage barriers, opening up 47 stream miles;
- ◆ Restore 282 miles of instream habitat;
- ◆ Restore 747 acres and 113 stream miles of riparian habitat;
- ◆ Restore 129 acres of wetland habitat; and
- ◆ Protect 288 acres of habitat through land acquisition, easement or lease.



A tribal crew swings a log into place to create habitat for salmon in a creek. *NWIFC: J. Shaw*

Cooperation Essential

The needs of salmon, like all natural resources, are myriad and complex, crossing many watersheds, legal jurisdictions and political boundaries. No resource can be managed individually because each is connected to the other. The tribes know that cooperation is the key to successful natural resource management. Through a spirit of collaborative conservation that has prevailed in the region since the early 1980s, the tribes work with state, federal and local governments, conservation groups, industry and others on comprehensive efforts to return all wild salmon populations to self-sustaining levels.

Following are some examples of cooperative processes that are shaping salmon management – and many other aspects of natural resource management in western Washington – to help preserve, protect and restore wild salmon stocks.

Shared Strategy & Puget Sound Salmon Recovery Council

In 1999 three western Washington salmon stocks – Puget Sound chinook, Hood Canal/Eastern Strait of Juan de Fuca summer chum and Lake Ozette sockeye – were listed as “threatened” under the federal Endangered Species Act (ESA).

In response to overall decline of salmon and the ESA listings, and to prevent further listings, salmon leaders created the Shared Strategy for Puget Sound Salmon Recovery, a bottom-up collaborative approach to wild salmon recovery that links ongoing initiatives at the tribal, state, federal and local levels.

After nearly six years of intense work, a recovery plan for Puget Sound chinook and Hood Canal summer chum that meets ESA requirements has been delivered to the National Marine Fisheries Service (NMFS), the federal agency charged with implementing the ESA. The endorsement and participation of NMFS in the Shared Strategy process has been critical to the plan's success.

The Shared Strategy's 10-year trajectory for recovery of Puget Sound chinook integrates harvest, hatcheries and habitat in a recovery plan that addresses the needs of both people and fish.

The regional policy committee that guided development of the recovery plan has further expanded its membership and is now known as the Puget Sound Salmon Recovery Council. The council has grown from 22 to 34 members and includes representatives from each of the 14 watersheds in Puget Sound, as well as additional state, federal, environmental and business members. The group's first task is to develop a regional funding allocation strategy based on watershed priority plans and recovery goals.

Hatchery Reform

While hatchery salmon are not an acceptable substitute for wild salmon, and hatcheries are not a replacement for healthy ecosystems that naturally produce harvestable levels of wild salmon, these facilities provide a meaningful level of harvest that would not otherwise occur. Because of the need to protect weak wild salmon stocks, without hatcheries, there would be no salmon fishing at all in western Washington.

In FY 00, Congress adopted and funded the recommendations of a science advisory team to launch the Puget Sound and Coastal Washington Hatchery Reform Project, a systematic, science-driven examination of how hatcheries can help recover and conserve naturally spawning salmon populations and support sustainable fisheries.

Hatchery Reform means designing and operating hatchery programs in concert with the needs of wild salmon populations. Together with ongoing habitat restoration efforts and strict harvest regulations, Hatchery Reform is a fundamental part of efforts to recover wild salmon and sustain fisheries in Washington.

The tribal, state and federal co-managers are now implementing more than 1,000 recommendations developed by an independent Hatchery Reform science panel as part of the Hatchery Reform Project to aid recovery of wild salmon through improved hatchery management practices.

Puget Sound Partnership

The success of the Shared Strategy and its inclusive approach to addressing natural resource management challenges led Washington Gov. Chris Gregoire in 2005 to create the Puget Sound Partnership to significantly improve the health of Puget Sound by 2020. "Cleaning and protecting Puget Sound must be at the top of our state agenda. But I know from experience that state government can't do it alone," she said.

Gregoire enlisted some of the region's leading citizens to form a new public/private group called the Puget Sound Partnership to develop an aggressive 15-year plan to solve Puget Sound's most vexing problems. As part of her initiative, the Governor and the 2006 Legislature put into place a \$52 million spending package and two laws that will address critical short-term needs.

The Puget Sound Partnership provided its recommendations on a comprehensive restoration effort for Puget Sound in December 2006. At the core of the Partnership's recommendations is a new approach that would address the whole ecosystem—both the people and natural elements of our region.

Salmon Management Case Study

Broodstock Program Preserves Native Elwha Steelhead

The Lower Elwha Klallam Tribe wants to make sure the Elwha River's remaining native steelhead aren't harmed when two fish-blocking dams on the river start to come down in 2009.

Over the last couple of years, the tribe has been developing a broodstock from late winter steelhead, which is proposed for listing as "threatened" under the federal Endangered Species Act. The tribe has been gathering more than 1,000 fry annually from egg nests, also known as redds, in the lower five miles of the river. Broodstock collection will continue until the dams are removed.

The fry are being raised as part of a captive broodstock project at the tribe's hatchery. The fish will be reared to adulthood and then spawned to produce native juvenile steelhead. These offspring will be released as yearlings into the river, depending on the water conditions during the dam removal process. As the native steelhead population increases, releases of non-native steelhead from the tribe's hatchery will be reduced.

Developing the native steelhead broodstock will help the fish survive the massive changes in the river – such as greatly increased sediment levels – that are expected to occur when the dams are removed, said tribal habitat manager Mike McHenry.

The two fish-blocking dams, the 108-foot Elwha dam and 210-foot Glines Canyon dam, were built in the early 1900s to provide hydroelectric power. Both dams were built without fish ladders, preventing fish from migrating upstream to spawn. Currently, salmon and steelhead can only spawn below the dams, in the lower five miles of the river.

The dams are owned by the federal government; Olympic National Park is spearheading the removal effort. The total cost of the project is estimated at \$182 million.

"We think the steelhead fry we are collecting are remnants of the wild run that's been impacted by the construction of the dams and the importation of non-native stocks of fish," McHenry said.

The broodstock project is funded in part by the Pacific Coastal Salmon Recovery Fund.



Lower Elwha Klallam tribal staff, from left, Larry Henderson, Ray Moses, Keith Lauderback and Mel Elofson collect steelhead fry for the tribe's broodstock program. *NWIFC: T. Royal*



Greg Woodruff, Quileute, pulls in a coho salmon from the Sol Duc River near LaPush. *NWIFC: D. Preston*

Harvest Management

Harvest management must be responsive to the conservation needs of the salmon resource, protecting weak wild stocks while allowing appropriate harvest of healthy, mostly hatchery-raised salmon.

Salmon runs and fisheries in Puget Sound, the Strait of Juan de Fuca and nearshore coastal waters are co-managed by the treaty Indian tribes and WDFW. Tribal and state managers work cooperatively, through the Pacific Fishery Management Council (PFMC) and the North

of Falcon process (NOF), to develop fishing seasons that protect the weakest salmon stocks. The PFMC is a public forum established by the federal government that is charged with creating a comprehensive fisheries plan for ocean fishing, incorporating the varied interests of tribal, state and federal managers and commercial, sport fishing and environmental groups.

While the PFMC is planning coastwide ocean fisheries, treaty tribes and the states of Oregon and Washington in the NOF process are outlining their inshore and coastal fisheries. The North of Falcon process is so named because it deals with fisheries from north of Cape Falcon, Ore., to the border between the U.S. and Canada. Through NOF, tribal and state biologists forecast expected salmon returns to specific areas. Population estimates are based on biological data collected during salmon out-migration, along with habitat information and weather conditions that affect salmon populations. The number of fish available to harvest, determined by the co-managers, is what's left after escapement needs are met. Escapement is the number of fish needed to spawn and sustain a run at a desired level.

U.S./Canada Pacific Salmon Treaty

Adult salmon returning to most western Washington streams migrate through both U.S. and Canadian waters, and are harvested by fishermen from both countries. For decades, there were no restrictions on the interception of returning salmon by fishermen of neighboring countries.

In 1985, after two decades of discussions, the Pacific Salmon Treaty (PST) was created through the cooperative efforts of the tribes, state governments, U.S. and Canadian governments, and sport and commercial fishing interests. The Pacific Salmon Commission (PSC) was created by the United States and Canada to implement the treaty, which was updated in 1999. The PSC establishes fishery regimes, develops management recommendations, assesses each country's performance and compliance with the treaty, and is the countries' forum to reach agreement on mutual fisheries issues.

An eight-member bilateral body that includes representatives of tribal, state and federal governments governs the PSC. Four regional panels composed of fisheries managers and industry representatives advise the PSC on policy matters.

As co-managers of the fishery resources in western Washington, the tribes' participation in implementing the PST is critical to achieve the shared goals of the treaty in protecting, sharing and restoring salmon resources. In addition to serving at the policy level on the PSC and its panels, tribal representatives also participate on the many committees and work groups that provide technical support to implement the treaty.

This year will mark the beginning of renegotiations of several important sections of the treaty, including sections managing chinook, coho and chum catch. The management of chinook salmon, in relation to their status in the United States as a species listed under the federal Endangered Species Act (ESA), will be an important topic. The understanding of how fisheries impact listed chinook stocks has changed in the nearly 10 years since the last renegotiation.

Fisheries research is an integral part of treaty implementation. The treaty tribes have designated a substantial portion of their PST funding to conduct the necessary research, data collection, fishery monitoring and habitat improvement activities needed to manage salmon fisheries in the context of the PST.

Puget Sound Chinook Harvest Management Plan

The Puget Sound Chinook Recovery Plan developed through the Shared Strategy process addresses all aspects of the decline of ESA-listed wild Puget Sound chinook and includes a harvest management plan that will aid recovery. The harvest plan, developed by the co-managers, has been approved by NOAA Fisheries, the federal agency in charge of implementing the ESA.

The Chinook Harvest Plan is intended to ensure that fishery-related mortality will not harm rebuilding efforts for natural Puget Sound chinook salmon populations. The fundamental intent of the plan is to enable harvest of strong, productive stocks of chinook, and other salmon species, and to minimize harvest of weak or critically depressed chinook stocks.

The harvest management plan outlines objectives that will guide the Washington co-managers in planning annual harvest regimes until 2009. While the plan guides the implementation of fisheries in Washington that are under the co-managers' jurisdiction, it also considers the total harvest impacts of all fisheries, including those in Alaska and British Columbia, to ensure that conservation objectives for Puget Sound are achieved.

As listings of endangered species have grown in the region, so has the need to ensure that fisheries management activities are not incidentally harming those protected species. Proposed in-river salmon research projects, for example, must be extensively reviewed, evaluated and submitted for authorization under the ESA.

Tribal hatcheries must also comply with federal ESA requirements to ensure that their management practices do not harm listed salmon.

ESA compliance work extends to non-salmon species as well. For example, tribes must conduct extensive reviews to ensure that their fisheries management programs do not harm recently listed Puget Sound orcas or inappropriately impact critical habitat that has been set aside for their needs. Meanwhile, ESA listings continue to increase in the region. Puget Sound steelhead are proposed to be added to the list. A joint steelhead management is being developed by the tribal and state co-managers to address the potential listing.

Treaty Indian Fishery Catch Monitoring Program

One of the keys to salmon harvest management in western Washington is the treaty Indian Fishery Catch Monitoring Program (TICMP) managed by the NWIFC.

The TICMP provides accurate catch statistics for the Treaty Indian Fisheries in the *U.S. v Washington* case area. Using procedures developed cooperatively with the Washington Department of Fish and Wildlife (WDFW), the catches of all salmon, shellfish (clams, crab, geoducks, etc.), and marine fish by treaty Indian fishers are entered into an electronic database. This allows a single set of data accepted by both the tribes and state of Washington to be maintained as the historical database for use in the management of Puget Sound and coastal Washington fisheries. This program also provides the Northwest Indian Fisheries Commission (NWIFC) member tribes the ability to access both treaty and non-treaty summary catch data for Puget Sound and coastal Washington fisheries over the Internet using an on-line database system developed and maintained by the NWIFC.

All state and tribal licensed fish dealer/buyers are issued numbered fish receiving tickets by WDFW and are required by law to fill out a fish ticket for each landing processed. When treaty fishers sell their catches, their identification number is included on a fish receiving ticket that records the number, weight, species and location of harvest. Once the catch data have been recorded on a ticket, that data must be reviewed by the tribe, edited and entered into the database before it becomes incorporated into the record of final catch statistics. Currently, more than 50,000 fish tickets are processed annually by tribes and the NWIFC.

The Treaty Indian Catch Monitoring Program is an important tool used in resource management. It helps monitor harvest levels and ensures the 50-50 sharing formula between the tribes and state. These catch data are also critical to real-time harvest management and are shared on a same-day basis with WDFW. In addition, historical catch data in the system is used to develop annual abundance forecasts for many species and is used in computer models that are used to evaluate and manage fisheries.

Harvest Management Case Study

South Sound Fall Chum Test Fishery

Test fisheries are an important harvest management tool. They provide critical, real-time data about the strength of returning salmon runs as well as other important information to fine-tune harvest management plans and help ensure that weak salmon stocks are protected.

The South Sound fall chum test fishery – conducted annually by the tribal and state co-managers near Kingston for the past 25 years – is one example of a test fishery. Once a week for six weeks, the test fishery takes stock of the South Sound chum salmon that return each fall.

“This test fishery gives us a better understanding of what the run looks like each year,” said Bill Patton, South Sound biologist for the Northwest Indian Fisheries Commission, which coordinates the test fishery.

Tribal and state biologists compare test catches from previous years to provide an overall look at the health of the chum run and predict the actual annual run size.

The long term data help biologists see how Puget Sound fall chum are faring. In the last decade, the number of chum returning has steadily increased, Patton said. In the 1990s, only about 200,000-300,000 fish were returning each fall. This year, the run was expected to reach 700,000.

Tribal biologists also take scale samples to determine how much of the run is made up of 3-, 4- and 5-year-old fish. Most chum return as 4-year-old fish; the ratios of 3- and 5-year-old fish help biologists get a better idea of what next year’s returns might look like.

The ratio of male to female salmon is also recorded in the test fishery. Because male salmon tend to return slightly earlier than female salmon, the test fishery sex ratios can help determine whether the run has reached its peak.

A larger run also means an increase in harvest for fishermen. After subtracting the escapement goal – the number of fish that need to be allowed to pass upstream to spawn – a harvest allocation for Indian and non-Indian fishermen is then estimated. Each group is allowed to harvest half of the surplus chum salmon returning to South Sound.

“This test fishery is unique because it’s rare that you have a list of consistent data over such a long period of time,” Patton said. “We are not going to be perfect every time, but it gives us a pretty accurate look at the strength of the chum runs returning each year to a fairly large area.”



Chum salmon are hauled on board a purse seiner during the annual South Sound fall chum test fishery.
NWIFC: T. Royal



Josh Dorland, Quinault Indian Nation fisheries technician, pours Salmon River coho eggs into trays at the QIN's Lake Quinault Hatchery. *NWIFC: D. Preston*

Hatchery Management

The first salmon hatcheries in the state of Washington were built more than 100 years ago, largely to compensate for the lost natural salmon production caused by damaged and disappearing habitat. Today, more than 100 hatcheries are operated in Puget Sound and coastal Washington by the treaty tribes, Washington Department of Fish and Wildlife and U.S. Fish and Wildlife Service, making up the largest hatchery system in the world. More than 41 million salmon were released from the hatcheries in 2005.

Nearly three-fourths of all the salmon harvested in Puget Sound are supplied by hatcheries. These salmon are important for meeting treaty tribal harvest obligations because many wild salmon populations are severely de-

pressed. Without hatcheries, there would be no salmon harvest at all in western Washington.

Today, hatcheries aren't just producing fish for harvest – they are helping recover what were once thriving salmon populations. Some hatcheries are designed to support wild runs, such as through broodstock programs, in which native fish are captured, spawned in a hatchery, and their progeny released to help bolster naturally spawning salmon runs. Tribal hatcheries support the tribes' treaty-reserved rights to fish, and also provide additional fish for harvest by non-Indian fishermen.

To keep the salmon populations robust, the tribal and state co-managers have implemented a system of hatchery reform, drawing on state-of-the-art science to minimize the impacts of hatcheries on wild salmon.

Hatchery Reform Project

As a result of the listing of several Puget Sound and coastal salmon stock under the federal Endangered Species Act in the late 1990s, Congress in 2000 established the Puget Sound and Coastal Washington Hatchery Reform Project – a systematic, science-based examination of how hatcheries can help recover and conserve salmon populations while supporting sustainable fisheries.

The idea behind the project is to create and operate hatchery programs in concert with the needs of wild salmon populations. The hatcheries are not meant to replace healthy spawning and rearing habitat but to be an extension of it, like a productive tributary of a river. Together with ongoing habitat restoration efforts and strict harvest regulations, Hatchery Reform is a fundamental part of efforts to recover wild salmon and sustain fisheries in Washington.

An independent science panel, the Hatchery Scientific Review Group (HSRG), was developed to help tribal, state and federal managers develop a clear understanding of hatchery management goals in each region. The panel identified more than 1,000 recommendations for changes at individual hatcheries and 18 recommendations for changes across the entire western Washington hatchery system.

The HSRG also produced three principles that will guide hatchery management in the future:

- ◆ Goals for all salmon stocks must be quantified to show how they are valuable in their own community, such as through harvest, conservation, education and research.
- ◆ The purpose, operation and management of each hatchery program must be scientifically defensible and consistent with current best available scientific knowledge.
- ◆ Decisions must be informed and modified through an adaptive management approach that continuously evaluates those decisions as new scientific information becomes available.

Hatchery Rehabilitation And Maintenance

Some of the HSRG's recommendations included making capital improvements to tribal hatchery facilities. However, most of those badly needed improvements have been beyond the tribes' financial reach. While tribal facilities in western Washington have been rearing and releasing fish for three decades, these hatcheries have been rapidly deteriorating because there has been little federal funding available for maintenance and rehabilitation. These aging facilities now have buildings and fish-rearing structures in dire need of rehabilitation work – with no funding sources.

Most tribal hatcheries operating today were established with the aid of federal funding when the tribes started their fisheries programs in the 1970s following the Boldt Decision, which reaffirmed the tribes' treaty-protected right to 50 percent of the harvestable fish. However, federal funding has not kept pace with the ongoing maintenance and rehabilitation needs for these 30-year-old facilities. The funding shortfall threatens not only the ability of the tribes to implement much-needed hatchery reform projects to help protect wild salmon stocks, but also the tribe's basic ability to produce hatchery salmon for harvest.

Meanwhile, spawning and rearing techniques have advanced and the management and regulatory environments affecting hatchery operations have changed. Tribal hatcheries need consistent funding to replace or add structures to ensure hatcheries are safe, effective, and operating with the best management practices. Funds are also needed to ensure that tribal hatchery operations are biologically compatible with regional salmon recovery efforts and are in compliance with the latest regulatory and legislative mandates.

Under the ESA and the Hatchery Reform Project, hatcheries in Washington have undergone a comprehensive evaluation that has identified badly needed improvements in infrastructure and science-based operation. These include tasks such as implementing new spawning and rearing protocols, constructing broodstock weirs, modifying ponds, developing new water sources and constructing pollution abatement systems. Facility rehabilitation and science-based management are perpetual requirements of operating a hatchery system.

Tribes also need technical assistance in genetic management, salmon ecology, biometrics and other areas to help inform and guide their hatchery operations. The 20 treaty Indian tribes in western Washington no longer receive funding for these services under Hatchery Reform.

Third party litigation is a very real possibility if tribal hatcheries are unable to meet standards for ESA-listed wild salmon in western Washington. This could result in the closure of all hatcheries, the cessation of all sport and commercial fisheries, and a breach of the trust responsibility the federal government has to the treaty tribes. The federal government, through the Bureau of Indian Affairs, has a trust responsibility to maintain these facilities in good operational condition to ensure compliance with ESA mandates and Hatchery Reform recommendations.

Fish Health, Genetics

The member tribes of the NWIFC created the Tribal Fish Health Program (TFHP) in 1988 to meet the needs of their salmon enhancement and supplementation programs. Today, the TFHP program based at the NWIFC is staffed by four fish pathologists and one microbiologist, supported by a fully-equipped fish health diagnostic lab. The program's goal is to assist tribes in rearing and releasing healthy fish that will help sustain tribal fisheries and restore wild populations.

The tribal fish health program runs a health-monitoring program, which is designed to maintain the health of the fish while they are in the hatchery and to identify and correct problems before they occur. NWIFC pathologists conduct monthly health exams on fish stocks at each tribal hatchery from the time the adults return to spawn until the time their progeny are released from the hatchery. The pathologists annually screen for diseases in a representative number of adults from each tribal hatchery.

If a disease event does occur, a pathologist promptly visits the site, diagnoses the illness and recommends treatment. If a drug or chemical treatment is necessary, the pathologist will work closely with hatchery staff to ensure the antidote is administered safely and effectively.

TFHP staff members also work closely with tribal enhancement staff to provide technical support in fish culture and other fish health related areas. This includes keeping tribal staff abreast of new developments in fish health techniques and evaluating new strategies for improved hatchery fish survival.

NWIFC staff also work with tribal hatchery programs to ensure protection of wild salmon genes and maintain the genetic health of hatchery-produced salmon. Two geneticists provide support for tribes on issues involving genetics and salmon recovery. Topics range from appropriate uses of hatcheries in salmon recovery programs; planning, implementation and monitoring of hatchery research; risk assessment; and mixed stock fishery analysis using genetic data.

Mass Marking

The treaty tribes operate an extensive hatchery salmon mass marking program in response to a 2002 congressional mandate that all fish produced for harvest and released from federally funded or managed hatcheries be marked to facilitate selective fisheries.

Mass marking enables mark-selective fisheries to be conducted in mixed stock areas, such as the Strait of Juan de Fuca, where hatchery stocks mingle with depressed wild stocks before each seeks out its stream of origin. It also allows managers to easily identify hatchery fish that spawn with wild stocks in the natural environment and take steps to control possible negative effects.

Hatchery salmon are mass marked by having their fleshy adipose fin removed and, in some cases, having a tiny coded wire tag inserted in their nose. Anglers who hook a salmon are able to distinguish the more abundant fin-clipped hatchery salmon from their wild counterparts and release the wild salmon to continue its spawning migration. The base coded wire tagging program is seminal to fishery and stock assessment data and analysis. When coded wire tagged salmon are harvested as adults, tag data provides important information about survival rates, migration patterns, harvest rates and other factors.

The tribes' Northwest Indian Fisheries Commission (NWIFC) operates four specially designed trailers to mass mark 3 million to 5 million young chinook and coho each year at tribal hatcheries. Millions more are mass marked by the state of Washington; the Canadian government also mass marks some of its salmon to facilitate management under the U.S./Canada Pacific Salmon Treaty.

Hatchery Management Case Study

Disease Control Policy Helps Protect Wild, Hatchery Salmon

To ensure continued health of Northwest salmon, the treaty Indian tribes of western Washington and the Washington Department of Fish and Wildlife are updating the Salmonid Disease Control Policy, which sets the comprehensive fish health standards for tribal and state hatcheries.

The goal of the policy is to protect wild and hatchery fish populations from pathogens that can be spread when eggs, adult and juvenile fish, or even water, are transferred between watersheds.

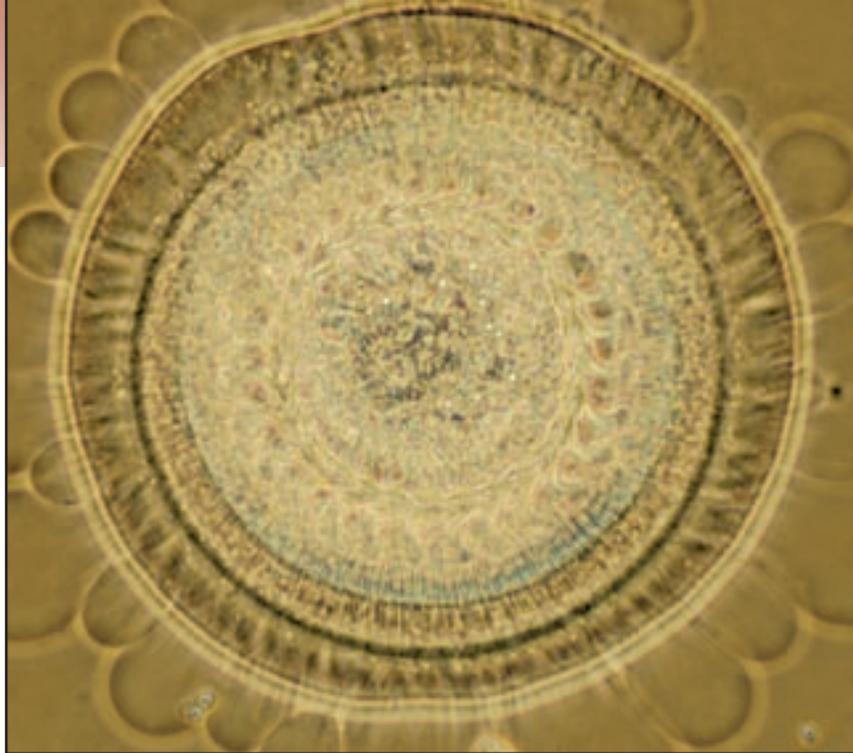
The policy sets forth minimum health standards, but the co-managers can implement more stringent security or safety measures at their discretion. The policy also requires the co-managers to regularly and openly communicate about issues that endanger the health of wild and hatchery fish.

“The most effective part of the policy has been the communication that was required between the tribes and the state,” said NWIFC senior fish pathologist Bruce Stewart, who helped pen the policy. “Prior to the implementation of the Salmonid Disease Control Policy in 1991, there was nowhere near the level of communication on fish health issues that there is today.”

The fish health policy is especially important in watersheds where several hatcheries are operated individually by tribes and agencies.

“When you have several different hatcheries within the same watershed, everyone needs to be on the same page to ensure a healthy environment for salmon,” Stewart said.

Prior to the policy’s development in 1991, there were no uniform fish health standards for state, federal and tribal facilities. The policy was last revised in 1998; a third update will be completed in 2007.



Preventing the spread of disease organisms such as the Tricodina parasite shown here, is a primary goal of the tribal and state co-managers’ Salmonid Disease Control Policy. NWIFC: C. Olson



Will Hudson, Hoh tribal fisheries technician, spreads hay on the slopes of Braden Creek where a fish-blocking culvert once stood. The tribe worked with the landowner to remove the culvert and restore the slope to its historic grade. *NWIFC: D. Preston*

Habitat Management

Habitat Key to Wild Salmon Recovery

Conservative harvest practices and Hatchery Reform aren't enough to sustain healthy salmon populations. Habitat quality and quantity, the primary limiting factors for wild salmon productivity, must be improved to take advantage of the outcomes of changes in harvest and hatchery practices.

Throughout the course of the 20th century, as farmers established an agriculture industry

within the valleys of western Washington, lands were cleared and irrigation systems were built. In some cases, rivers and streams were rerouted or straightened, immediately degrading the salmon's habitat. In other cases, trees and other forest debris that provided important habitat elements to salmon were cleared from rivers in the mistaken belief that it would help salmon. Instead of slower flowing, woody-debris-filled habitat that provided areas for salmon to feed, rest and escape predators, the salmon were confronted with fast-moving water and nowhere to find shelter.

The treaty Indian tribes are working hard to restore some of that lost habitat. Tribes are collaborating with property owners who have salmon-bearing streams on their land. Engineered logjams and other woody debris are being added to streams to slow flows and create cool pools of water in which salmon rest and feed. Tribes also conduct extensive water quality monitoring efforts to check for pollution and to ensure that other factors, such as dissolved oxygen levels, are adequate for salmon and other fish.

To make limited federal funding work to its fullest, the tribes partner with state agencies, environmental groups, industry and others through collaborative habitat protection, restoration and enhancement efforts. One such effort is the Timber/Fish/Wildlife Forests and Fish Report, through which forest practices are cooperatively managed to ensure protection for salmon, while also ensuring the health of the timber industry. Tribes also are partners with the Washington Department of Fish and Wildlife in the Salmon and Steelhead Habitat Inventory and Assessment Program, which has produced the "State of Our Watersheds Report" – a comprehensive account of the health of the region's salmon habitat that is helping to provide a blueprint for salmon recovery.

Timber/Fish/Wildlife Forests and Fish Report

A national success story with a 20-year legacy of cooperative conservation began with the Timber/Fish/Wildlife (TFW) Agreement of 1987. TFW and the Forests and Fish Report's (FFR) strategy to address endangered species is one of the most comprehensive and successful national examples of cooperative conservation in forest resource management. The TFW cooperative strategy brings together tribes, state and federal agencies, environmental groups and private forest landowners, and has been successful at minimizing legal and legislative battles.

A variety of factors – including the listings for several western Washington salmon stocks under the federal Endangered Species Act, ongoing statewide water quality degradation, and the concern over the continued economic viability of the timber industry – brought TFW participants together in November 1996 to develop joint solutions to these problems. Federal, state and local governments participated with original TFW members in what is commonly referred to as the TFW “Forestry Module Negotiations,” a significant component of Washington’s statewide salmon recovery effort. The result was a plan to update forest practices rules called the Forests and Fish Report (FFR), which was completed in April 1999, and later adopted by the Washington State Legislature. The FFR is based on four goals:

- ◆ To provide compliance with the ESA for aquatic and riparian-dependent species on non-federal forest lands;
- ◆ To restore and maintain riparian habitat on non-federal forest lands to support a harvestable supply of fish;
- ◆ To meet the requirements of the federal Clean Water Act for water quality on non-federal forestlands; and
- ◆ To maintain the economic viability of the timber industry in the state of Washington.

The six caucuses participating in FFR implementation are tribal, state, federal and local governments, the timber industry and conservation groups.

Adaptive management rules are the keystone to both the TFW and FFR strategies. Adaptive management is the process of evaluation and monitoring to constantly gauge the effectiveness of management practices and to determine if changes are needed.

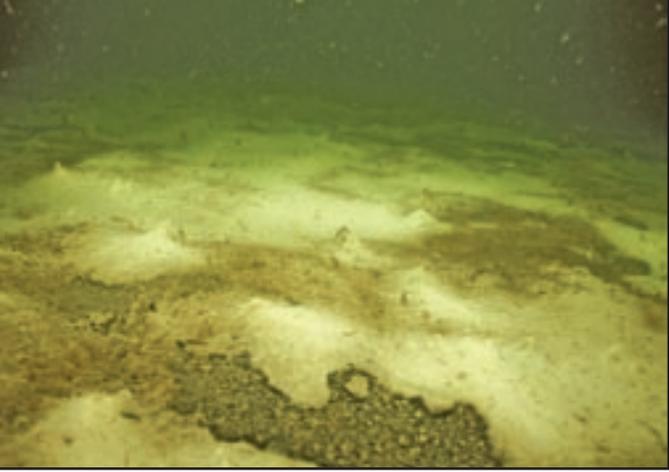
Tribal participation is a critical component of TFW and FFR implementation. The federal stakeholders continue to rely heavily on tribal technical information to gauge its success. The tribes offer a centuries-old tradition of resource stewardship, practice state-of-the-art technological innovation, and are strategically located to respond to the critical management needs in their local watersheds. As they have throughout the TFW/FFR process, participating tribes are utilizing the NWIFC for necessary technical expertise and to coordinate their work effectively and collaboratively.

Salmon and Steelhead Habitat Inventory and Assessment Project

Habitat is key to wild salmon recovery. The Salmon and Steelhead Habitat Inventory and Assessment Project (SSHIAP), a joint effort of the treaty tribes and state of Washington since 1995, is providing a blueprint for joint tribal/state action to define a cooperative process to implement habitat and restoration strategies by:

- ◆ Documenting and quantifying past and current habitat conditions;
- ◆ Providing a consistent framework for data analysis;
- ◆ Assessing the role of habitat loss and degradation on the condition of salmon and steelhead stocks; and
- ◆ Assisting in the development of stock- or watershed-specific strategies for habitat protection and restoration.

In early 2005, SSHIAP produced the most comprehensive report to date on the status of salmon habitat in the region. “State of Our Watersheds” compiles decades of data collected by tribes, and state and federal agencies, painting a picture of the watersheds across western Washington. The report was updated in 2006.



The Skokomish Tribe discovered a bacterial mat, devoid of life, extending for four miles on the floor of Hood Canal. *Skokomish Tribe: S. Miller*

Puget Sound Partnership

In December 2005, Gov. Gregoire set an ambitious vision before a broad coalition of 21 Puget Sound leaders. She appointed representatives from building and timber industries, shellfish growers, agriculture and environmental interests, port authorities, and local, state, federal and tribal governments to the Puget Sound Partnership. The group was given a 10-month assignment to “develop recommendations for preserving the health and ecosystem of Puget Sound, and to help educate and enlist the public in achieving recovery of the Sound by 2020.” Five charges were presented to the Partnership as part of the governor’s request:

- ◆ An integrated set of actions to heal and protect the Sound;
- ◆ A call to engage the public;
- ◆ A way to organize work on an ecosystem level;
- ◆ Current and future funding strategies, and;
- ◆ The involvement of science to inform the effort.

Almost half of the members of the partnership are part of the Shared Strategy process that developed a recovery plan for Puget Sound chinook. As part of the initiative, Gov. Gregoire and the 2006 State Legislature put into place a \$52 million spending package to jumpstart the effort.

In December 2006, the partnership, co-chaired by the governor, NWIFC Chairman Billy Frank Jr., and former U.S. Environmental Protection Agency Administrator William Ruckelshaus, delivered a report and recommendations for a comprehensive, ecosystem-based approach to protect and restore Puget Sound. The report included the following essential priorities to achieve a healthy Puget Sound by 2020:

- ◆ Protect essential Puget Sound habitat;
- ◆ Accelerate control and clean-up of pervasive toxic pollution;
- ◆ Significantly reduce pollution from human and animal wastes and other sources;
- ◆ Ensure adequate water for people, fish and wildlife, and the environment; and
- ◆ Continue rigorous scientific and policy analysis to prioritize and build common understanding about the work needed.

The focus now shifts back to state government to obtain funding to begin implementation of the partnership’s recommendation, as well as creation of a governance structure to help guide those efforts.

Habitat Case Studies

Skokomish Tribe Discovers Bacterial Mat in Hood Canal

In the Hood Canal region of Puget Sound, the Skokomish Tribe this summer discovered a four-mile-long area devoid of marine life. A 3-1/2-foot-thick fluffy layer of bacteria mats, found at a depth of about 50 feet, appears to be thriving in the low oxygen levels that have plagued the fjord in recent years. Most of the problem is caused by steadily increasing nutrient levels contributed by failing septic systems and fertilizers. The nutrients feed algae blooms that draw oxygen from the water as they die and decompose.

The bacterial mat is a further indication that the ecology of Hood Canal is in trouble, said Dave Herrera, fisheries policy representative for the Skokomish Tribe. “We are deeply concerned that more of these dead zones may exist in other parts of southern Hood Canal. Our treaty-protected resources and tribal economy are threatened by the declining health of Hood Canal.”

Discovery of the bacterial mat was preceded in just a few days by the largest fish kill recorded in Hood Canal. Many thousands of shrimp, crab, bottom fish, octopus and other species died from low oxygen levels in the canal, an event that is becoming more common every year.

The health of Hood Canal is a focus of the Puget Sound Partnership created by Washington Gov. Chris Gregoire to significantly improve the health of Puget Sound by 2020.

Nisqually Tribe Creates Critical Salmon Habitat

The Nisqually Indian Tribe celebrated one of the largest steps ever taken in the effort to restore salmon habitat in Puget Sound. The tribe recently put the finishing touches on a decade-long effort to transform 140 acres of former cow pasture into critical salmon habitat. The tribe and its partners in the restoration held a “Welcoming the Tides” ceremony in late October to mark the accomplishment.

“It’s coming to life again, right in front of our eyes,” Billy Frank Jr., chairman of the Northwest Indian Fisheries Commission, told the more than 100 people who turned out for the event. Other speakers included former U.S. Environmental Protection Agency Administrator Bill Ruckelshaus, co-chairman of the Puget Sound Partnership, as well as U.S. Rep. Norm Dicks (D-Wash.).

A new wetland within the restored estuary was dedicated for the Braget Family, who operated the cattle ranch on the site for more than a century. “The new Braget Marsh will honor the family whose efforts protected this stretch of Puget Sound,” said David Troutt, natural resources director for the Nisqually Tribe.

Most of the massive Nisqually River estuary was diked in the early 20th century to create farm land. “If all of the diked estuary in the Nisqually basin was restored, we could double the survival of wild chinook salmon with that additional habitat,” said Jeanette Dorner, salmon recovery program manager for the tribe. Nisqually River chinook, like all Puget Sound chinook stocks, are listed as “threatened” under the federal Endangered Species Act.

In addition to the 100 acres being restored this summer, the tribe already has opened 40 acres in the same area during the last 10 years. “You start to see changes almost immediately in a restored estuary. Once that tide comes in the first time, it becomes an estuary,” Dorner said. “Plants that can grow in saltwater came back by themselves, providing valuable habitat to salmon and other wildlife.”

The tribe’s effort on the Pierce County side of the Nisqually River is a precursor to a much larger estuary restoration planned on the Thurston County side, where the Nisqually National Wildlife Refuge is in the planning stages of a project that will reclaim almost 700 acres of estuary. “Working closely with the Refuge, we can almost totally restore the entire historic Nisqually River estuary,” said Dorner.



Nisqually tribal elder Bob Sison blesses 140 acres of newly created estuary habitat at the mouth of the Nisqually River.
NWIFC: E. O’Connell



Coastal Ecosystem Management

The need for an ecosystem-based approach to address fisheries management and environmental issues in Washington coastal waters has come into sharp focus in recent years, fueled in large part by major studies conducted by the U.S. Commission on Ocean Policy and the Pew Charitable Trust.

The Olympic Coast Marine Sanctuary lies within the traditional fishing areas of the Makah, Quileute and Hoh tribes and the Quinault Indian Nation. This view shows the Island of Tatoosh at the mouth of the Strait of Juan de Fuca within the traditional fishing waters of the Makah. *NWIFC: D. Preston*

To address serious declines in water quality, losses of species and habitats and a host of

other problems plaguing coastal waters, the U.S. Commission on Ocean Policy in 2004 delivered recommendations for a coordinated and comprehensive national ocean policy to the President and Congress. The Commission's final report, "An Ocean Blueprint for the 21st Century," contains 212 recommendations addressing all aspects of ocean and coastal policy. Among those recommendations were:

- ◆ Restructuring U.S. ocean governance, including establishing a National Ocean Council within the Executive Office of the president;
- ◆ Strengthening the National Oceanic and Atmospheric Administration; and
- ◆ Increasing spending on marine research and education.

Overall, the report estimates costs for reversing declines and restoring the nation's coast and oceans at about \$4 billion annually, and suggests that these funds could come from current off-shore oil and gas leases in U.S. waters.

Coastal treaty Indian tribes have always relied on the ocean's resources. Species such as salmon, groundfish, whales and crab are central to tribal cultures. The treaty Indian tribes believe that these and all natural resources are connected and that only a holistic ecosystem management approach can ultimately be successful in meeting the needs of those resources and those who depend upon them.

As co-managers of the natural resources along the Washington coast, tribes are being steadily confronted with increasing demands to address a growing list of natural resource and environmental management issues. Among those is the deaths of thousands of bottom-dwelling fish such as cabezon and lingcod, as well as Dungeness crab, which fled extremely low oxygen levels in waters off the Washington coast in the Quinault Indian Nation's usual areas of fishing during July and August.

Additional demands are further placed on tribes, as co-managers, to participate in governance forums such as the State Ocean Policy Workgroup and a newly created Intergovernmental Policy Council for the Olympic Coast Marine Sanctuary.

State Ocean Policy Workgroup

The Washington Ocean Policy Workgroup, created by Gov. Chris Gregoire, was an outgrowth of the U.S. Commission on Ocean Policy. The group consists of 20 members, made up of state agency heads, legislators, the governor's office and tribes. In 2005, the workgroup presented Gov. Gregoire with a list of immediate actions for more effective ocean management.

Among the group's recommendations was the creation of a governing board and council with representatives from management agencies and tribes, scientific communities, and stakeholder groups to establish management needs, align research priorities and monitor the progress through specific work plans.

A second report with more extensive, long-term recommendations was to be issued by the work group in December 2006.

Olympic Coast Marine Sanctuary Intergovernmental Policy Council

The coastal treaty Indian tribes, the State of Washington and the U.S. government are creating a policy council to guide the Olympic Coast National Marine Sanctuary. A memorandum of agreement (MOA) finalizing the council's creation was signed in early 2007.

The MOA creates an Intergovernmental Policy Council with members from each coastal tribe and the state to ensure coordinated and comprehensive management of the Olympic Coast National Marine Sanctuary (OCNMS) and its resources.

The OCNMS was created in 1994, encompassing 3,310 square miles of Washington coastal waters from Neah Bay to the Copalis River. These waters are home to many marine mammal and seabird species, diverse populations of kelp and intertidal algae and thriving invertebrate communities.

The sanctuary lies within the traditional harvest areas of the Makah, Quileute, and Hoh tribes and the Quinault Indian Nation. As sovereign nations, the tribes have treaty fishing rights and co-management responsibilities with the State of Washington for fish and other natural resources within the OCNMS.

"This is another positive step toward an ecosystem-based approach to managing these resources," said Mel Moon, natural resources director for the Quileute Tribe. "We saw that regional-based planning is effective when we did watershed planning in the past."

The Policy Council will provide a forum for policy recommendations, communication and exchange of information regarding the management of the marine resources and activities within the boundaries for the OCNMS.



A Quileute tribal fisherman's catch of Dungeness crab is unloaded in LaPush. *NWIFC: D. Preston*

Tribal Dungeness Crab Fishery

Environmental damage to the lucrative coastal Dungeness crab fishery has tribes particularly concerned.

The state commercial crab season nets more than 20 million pounds valued at nearly \$1 billion, with the preponderance of catch and profit going to 311 non-tribal fishermen. In the 2005 season, Quileute and Quinault Indian Nation (QIN) tribal fishermen landed more than 1.4 million and 2.7 million pounds, respectively; record landings for both, yet only a small percentage of the overall harvest. Inconsistent crab abundance in the Neah Bay area makes the crab fishery less significant, but still important, for the Makah Tribe. The Hoh Tribe plans to participate in the future.

“We need more information about Dungeness crab. Very little is known about their migration and how harvest affects subsequent generations,” says Mel Moon, natural resources director for the Quileute Tribe. “If we know in season where, when and how much crab is being caught, adjustments can be made to preserve the resource and pro-

vide better opportunity for tribal fishermen,” said Moon. A vessel monitoring system used extensively on the East Coast is one tool that might be used for crab. The system uses satellites to track when and where boats are fishing. “We’re already looking at that system to monitor groundfish catches and we think it would work well for crab, too,” Moon said.

Whaling

Protecting the health of other species in the marine ecosystem, such as gray whales, is also important to the tribes.

Whaling is so central to Makah tribal culture that in 1855, when the Makah ceded thousands of acres of land to the United States government through the Treaty of Neah Bay, the tribe reserved its right to continue whaling in traditional areas.

In the 1920s, the tribe voluntarily stopped harvesting Eastern North Pacific gray whales because their populations had been depleted by commercial whalers. By the 1990s, the whale stock had rebounded to historic high levels of about 17,000. In May 1999, the tribe harvested its first whale in 70 years under the management authority of the International Whaling Commission and the U.S. government. Legal challenges have prevented additional hunts, but the tribe is optimistic that these obstacles will be overcome.

Groundfish Management

Groundfish have always been important to the culture of the treaty Indian tribes in western Washington. Today, established harvest restrictions that protect weak wild salmon stocks – coupled with poor market conditions – have made groundfish species such as halibut, sablefish, Pacific cod and rockfish increasingly important to the treaty Indian tribes.

Unfortunately, just as coastal treaty tribes are beginning to fully access some of their treaty-reserved harvest of groundfish, several rockfish species have declined sharply. As a result, severe harvest restrictions have been implemented, threatening the cultural, spiritual and economic vitality of coastal treaty tribes.

Treaty-reserved fishing rights, upheld by the courts in *U.S. vs. Washington*, established the tribes as co-managers of the groundfish resource. The tribes work closely with the state of Washington and U.S. government to develop and implement species conservation plans for all groundfish stocks in Puget Sound and along the Pacific coast.

Halibut are managed through the International Pacific Halibut Commission (IPHC), a bilateral management entity established in 1923 by the governments of the United States and Canada. The mandate of the organization is to study and preserve the stocks of Pacific halibut within the territorial waters of both nations.

IPHC scientists assess the halibut stocks and the IPHC governing body develops a total allowable catch for stocks in various fishing areas along the Pacific Coast from Alaska to northern California.

Fisheries for groundfish species such as sablefish, whiting and rockfish – in waters from 3 to 200 miles off the Pacific Coast – are managed through the Pacific Fishery Management Council (PFMC) under the U.S. Department of Commerce. The council includes representatives of the National Marine Fisheries Service (NMFS), the non-Indian commercial fishing industry, the non-Indian recreational fishing industry, the states of Washington, Oregon, Idaho and California, as well as a tribal representative.

NMFS scientists assess stocks annually. Various advisory committees analyze the assessments and develop catch recommendations that are passed on to non-Indian fisheries.

Groundfish Resource Assessment

The PFMC manages the various groundfish species as a single, coastwide management unit with harvest levels set either as a single quota or as two regional quotas. This has led to disproportionate landings of fish at ports along the Pacific coast. Under this management approach, harvest is not directly related to the abundance of targeted species in a particular area. Consequently, harvest off the California coast can lead to increased harvest restrictions off Washington. As a result, the management responses under consideration for the tribes' usual and accustomed fishing areas off the Washington coast are actually being driven by stock status assessments from Oregon and California.



A Makah tribal member's catch of lingcod is unloaded in Neah Bay where bottom fish comprise a big part of the season's harvest of fish. *NWIFC: D. Preston*

The design of resource assessment efforts also has hampered timely management response to severe population declines. The majority of stock assessment estimates are based on annual shelf/slope surveys, but species-specific rockfish management results in a vast number of stocks that need regular assessment updates. Constraints associated with a coastwide management unit approach, coupled with the large number of species involved, has resulted in only a portion of the stocks being assessed in a timely manner.

The assessments, combined with differences in life history characteristics among some species, have led to critical data gaps for some species. Some rockfish species such as yelloweye and canary, for example, cannot be fully assessed because their preferred habitat is rocky sea bottom, which is inaccessible to NMFS trawl survey gear.

Tribal, state and federal fishery managers are discussing ways to restructure West Coast groundfisheries to address concerns about the status of yelloweye and canary rockfish. However, recent catch data from Washington fisheries indicate that the yelloweye decline off the outer coast is not as severe as the declines being observed in Oregon and California waters. The ability

to shape a regional management response in concert with regional abundance is hampered by lack of data caused by the existing structure of stock assessment surveys.

While some groundfish species are generally healthy – such as halibut, coastal Pacific cod and several species of flatfish – others are severely depressed, including a number of coastal rockfish species. In 2000, the NMFS completed a status review of six Puget Sound groundfish stocks in response to a petition to list the stocks as “threatened” under the federal Endangered Species Act. The species included Pacific hake, Pacific cod, walleye pollock and three species of rockfish. None were found to be in need of protection.

The agency examined a number of factors likely responsible for the species’ decline, including harvest, habitat degradation, climate changes, and marine mammal predation. Although there was a commercial Puget Sound hake fishery until the early 1980s, the remaining species are typically targeted by sport fishermen.

A number of rockfish stocks along the Pacific Coast have been in sharp decline in recent years. In particular, depressed populations of yelloweye, bocaccio and canary rockfish have led to severe coastwide management restrictions for both commercial and recreational fisheries.

Move To Ecosystem-Based Groundfish Management Needed

A transition to a more regional or ecosystem-based management approach is needed for groundfish. Management actions must be tailored to resource levels and related fisheries in particular areas. Regional management capability is required for effective resource management and more equitable distribution of impacts between fisheries. Tribal harvest of yelloweye rockfish has been minor, for example, but the fish is taken consistently in fisheries that are directed at other healthy groundfish species, such as halibut. As a result, the applications of coastwide proportional reductions on yelloweye rockfish has a disproportionate effect on tribal fisheries.

Tribal communities, with limited opportunities for economic diversification, already have been devastated over the past two decades by declining salmon populations and poor market conditions. The groundfish cutbacks come at a time when the coastal tribes are just beginning to fully access some of their treaty-reserved harvest of groundfish stocks. Tribal fishermen have invested heavily in the proper gear to fully participate in these fisheries, only to find their seasons curtailed.

Washington coastal treaty Indian tribes – Makah, Quileute, Hoh and the Quinault Indian Nation – are experiencing conservative quotas and conducting restrictive fisheries to ensure protection of weak groundfish stocks while allowing harvest of healthy groundfish populations.

The tribes continue to implement “trip limits,” restricting the number of fish from depressed groundfish stocks that can be harvested incidentally during fisheries on healthy fish populations. For example, tribal fishermen targeting halibut, sablefish or whiting are allowed only a small incidental harvest of a weak groundfish stock before being required to stop fishing in a particular area.

Tribes will continue to consider additional time and location restrictions to further minimize impacts on weak groundfish stocks. All of the potential impacts from the proposed tribal groundfish fisheries fall well within the guidelines being set by the PFMC.

As a manager of the groundfish resource with the federal and state governments, the tribes want to work together to address a significant lack of data on groundfish populations. When possible, biologists from coastal tribes and the Northwest Indian Fisheries Commission participate in the federal surveys that take place once every three years.

A goal of the co-managers is to have the survey occur every other year. One of the surveys is new and examines different areas than previous surveys. It is one step in the direction of obtaining better data for the different regions. The tribes would also like to see better surveys conducted in typical rocky groundfish habitat. Many of the current surveys for groundfish occur in areas with smooth bottoms, which is not preferred groundfish habitat.

The existing data gaps result in the need for restrictive fisheries coastwide, regardless of regional differences in the health and abundance of some rockfish stocks.

Better data enables the tribes to make more informed management decisions. It also enables the tribes to tailor their management approach to take into consideration the differences that exist among groundfish populations along the coast.



Youngwen Gao, a Makah fisheries scientist, holds a fish's earbone from which he can determine its origin. *NWIFC: D. Preston*

Coastal Ecosystem Management Case Studies

Ear Bones Hold Answers

Using a technique known to only a handful of scientists on the West Coast, a Makah tribal research scientist is able to tell where a fish comes from by analyzing its ear bone. The advanced research technique is providing much-needed information about halibut, black cod and other fish stocks important to the tribe.

Youngwen Gao identifies fish by analyzing the stable carbon and oxygen ratios found in the ear bone or otolith. The ear bones have annual, seasonal, and even daily growth rings like trees. The rings have been successfully used to age fish, but Gao is able to use the bones to tell him much more.

“When I’m analyzing the carbon, I’m analyzing the food that a fish has eaten. When I’m analyzing the oxygen, I’m getting information about the water,” said Gao.

Each body of water has a unique oxygen content. In the case of salmon, Gao is able to match the fish in the ocean with its home stream by analyzing the oxygen content found in the salmon’s otolith and matching it with the water samples from the stream.

Gao is also able to see the fluctuations in ocean temperature in the ear bones that give important clues about ocean conditions that affect fish survival.

“We are very fortunate to have Youngwen as a team member for the Makah Tribe and its fisheries program,” said Russ Svec, Makah fisheries manager. “Ten years ago we made a commitment to develop a program within fisheries that would focus on research projects in our usual and accustomed area of fishing. Research is critical when talking about treaty fishing rights and protection of future stocks,” he said.

In his work with halibut, Gao will determine where juvenile halibut found near Neah Bay originate. This is important because there are no known halibut spawning areas in the tribe’s fishing area. To effectively manage the resource, the tribe must know whether the halibut in their fishing waters come from healthy or weak stocks. The origin of the stocks helps determine harvest levels.

In the case of Northwest black cod, another bottom-dwelling fish, Gao will use the ear bone to determine if they are a unique stock of fish. It is unknown whether the stock is only found in the waters off British Columbia, and coastal Washington and Oregon, or whether it comprises several different local stocks. The information will help fishery managers more precisely determine the stock’s status and more effectively manage the resource.

Both black cod and halibut are important economically and culturally to the Makah Tribe. Salmon will always be important, but the bottom fish like halibut and black cod command higher prices.

Svec said the expertise amassed by the tribe will put a dent in the lack of good information about the actual numbers and behavior of fish stocks passing through the Makah fishing area.

'Dead Zone' Research Needed

Coordination of research projects was a key reason the coastal treaty tribes sought creation of an Intergovernmental Policy Council for the Olympic Coast Marine Sanctuary. Tribes are especially interested in research into low oxygen zones like the one that occurred this past summer off the beaches of the Quinault Indian Nation (QIN).

In mid-July and again at the end of the month, large numbers of bottom-dwelling fish such as cabezon and wolf eels, as well as Dungeness crab, washed up on QIN beaches from south of Taholah to near Ocean Shores. Meanwhile, QIN fishermen were pulling up eerily empty pots or pots full of dead crab.

“In the modern era of fisheries management, no one remembers ever seeing anything like this,” said Ed Johnstone, fisheries policy representative for QIN.

The Quinault event may be linked to a dead zone of low oxygen water that has been monitored off the coast of Oregon for the past five years, which has grown steadily larger each year. The dead zone is created by a natural upwelling of dense, oxygen-poor, but nutrient-rich water that supports the aquatic food chain. Oregon State University researchers are exploring the idea that the normal ocean winds and currents have changed, reducing the necessary mixing of ocean waters.

“This water that comes up is dense,” said Joe Schumacker, operations section manager for QIN fisheries. “In deeper waters, there is still some lighter, more oxygenated water above it, but as this dense, oxygen-poor water moves into shallower water and there’s no wind to mix it, it begins to take over the entire water column, like fog moving in. Species like wolf eels and lingcod hang out in 100 feet or less of water and aren’t adapted to low oxygen levels like deep-water species are. They are also pretty territorial and tend to stay in their little spots, so they either die there or they swim toward shore to escape and just run out of room.”

A buoy that monitors ocean conditions recorded extremely low oxygen readings in the waters off QIN beaches just before each of the fish kills. “We only have the one monitoring device off our shores here, but it doesn’t provide enough information,” said Johnstone. “We need additional and more accurate monitoring devices and more research to understand what’s going on.” The QIN is supporting several new research proposals related to the phenomenon, including a University of Washington research plan to add monitoring equipment off the Washington coast.

Similar oxygen-poor zones are found in Hood Canal, the Gulf of Mexico and other parts of the world; most are believed to be caused by pollution.

“There is just so much we don’t know and now we’re playing catchup to understand these events. We know these kinds of things happen, it’s just the first time it’s happened to us and we’re concerned,” said Johnstone.



Thousands of dead fish washed up on Quinault Indian Nation beaches during a low oxygen event off the coast of Washington. *NWIFC: D. Preston*



Paul Williams, shellfish program manager for the Suquamish Tribe, hoses Pacific oyster shells into Liberty Bay while Debbie Barton, tribal shellfish coordinator, pushes shells overboard with a rake. The shells were added to the bay to foster growth of Olympia oysters, which have nearly become extinct in Puget Sound because of pollution and other factors. *NWIFC: D. Friedel*

Shellfish Management

Shellfish have been a mainstay of western Washington Indian tribes for thousands of years. Clams, crab, oysters, shrimp and many other species were readily available for harvest year-round. Because large amounts could be harvested, cured and stored for later consumption with relative ease, shellfish were an important source of nutrition for tribes.

Shellfish remain important today for economic, subsistence and ceremonial purposes. The rapid decline of many western Washington salmon stocks, due in part to habitat loss from the region's burgeoning human population, has pushed shellfish to the forefront of many tribal economies.

Each treaty Indian tribe typically maintains a shellfish program which implements direction from tribal government.

A shellfish biologist assesses shellfish populations throughout a tribe's harvest area and recommends harvest regulations based on the level of shellfish available for harvest.

Each tribe manages their shellfish harvest in concert with non-Indian harvest and the harvest of other tribes by negotiating resource sharing agreements. These agreements ensure that each party is able to harvest their share of the available shellfish, while also protecting the resource. The tribes and state have entered into more than 27 different regional management plans for a variety of shellfish species. Each species has unique management requirements to ensure that biologically sound harvests occur.

Tribes enhance naturally occurring shellfish populations, often to the benefit of both tribal and non-tribal harvesters. Shellfish enhancement results in higher and more consistent levels of harvest than would occur naturally.

Tribes also conduct research on under-utilized species such as Olympia oysters, sea cucumbers and sea urchins. Often this research leads to new fisheries or a better understanding of the marine ecosystem.

The tribes have two distinct types of shellfish harvests – commercial and ceremonial/subsistence. Shellfish harvested during a commercial fishery are sold to licensed shellfish buyers who either sell directly to the public or to other commercial entities. Tribes collect taxes from tribal members who sell shellfish. The taxes are used to help pay for tribal natural resource programs. Ceremonial and subsistence harvests of shellfish, which have a central role in tribal gatherings and daily nutrition, are intended for tribal use only.

Preliminary data for 2005, the most recent data available, indicate that treaty tribes in western Washington harvested approximately 915,529 pounds of manila and native littleneck clams; 2.5 million pounds of geoduck clams; 294,005 pounds of oysters; 9.2 million pounds of crab; and 179,451 pounds of shrimp. These fisheries occur throughout Washington coastal areas and Puget Sound.

Tribal Treaty Shellfish Rights

As with salmon, the right to harvest shellfish lies within a series of treaties signed with representatives of the federal government in the 1850s.

“The right of taking fish at usual and accustomed grounds and stations is further secured to said Indians, in common with all citizens of the United States; and of erecting temporary houses for the purposes of curing; together with the privilege of hunting and gathering roots and berries on open and unclaimed lands. Provided, however, that they shall not take shell-fish from any beds staked or cultivated by citizens.”

– Treaty of Point No Point,
Jan. 26, 1855

In exchange for the peaceful relinquishment of what is most of western Washington today, the tribes reserved the right to continue to harvest fish and shellfish from all of their usual and accustomed harvest areas. The tribes were specifically excluded from harvesting shellfish from areas “staked or cultivated” by non-Indian citizens.

The tribes dominated clamming in the 1920s, but as tidelands continued to be purchased by non-Indians, tribes were slowly excluded from their traditional shellfish harvest areas. Tribal legal efforts to uphold the federal government’s treaty promises began in the early 1900s. In 1905, the U.S. Supreme Court ruled in *U.S. vs. Winans* that when a treaty reserves the right to fish in all usual and accustomed places, the state may not preclude access to those places.

In 1974, U.S. District Court Judge George Boldt ruled the tribes had reserved the right to harvest half the harvestable salmon and steelhead in western Washington through its treaties. After the “Boldt Decision” was upheld by the U.S. Supreme Court in 1979, tribal and state fisheries staffs began working together to develop fishery regimes that ensured harvest opportunities for both Indians and non-Indians.

This new atmosphere of cooperative natural resources management gave the tribes hope that their treaty-reserved rights to shellfish harvest and management could be restored. Talks between the tribes and the state began in the mid-1980s but were unsuccessful. In 1989, the tribes were forced to file suit in federal court to have their treaty shellfish harvest rights recognized. Years of negotiations were unsuccessful and the issue went to trial in 1994.

The Rafeedie Decision And Implementation Plan

After hearing testimony from tribal elders, biologists, historians and treaty experts, as well as testimony from private property owners and non-Indian commercial shellfish growers, Federal District Court Judge Edward Rafeedie followed in the footsteps of Judge Boldt.

He ruled that the treaties' "in common" language meant the tribes had reserved harvest rights to half of all shellfish from all of the usual and accustomed places, except those places "staked or cultivated" by non-Indian citizens – or those that were specifically set aside for non-Indian commercial purposes. His decision required tribes planning to harvest shellfish on private beaches to follow the time, place and manner restrictions on harvest.

"A treaty is not a grant of rights to the Indians but a grant of rights from them," Rafeedie wrote in his December 1994 decision, adding that the U.S. government made a solemn promise to the tribes in the treaties that they would have a permanent right to fish as they had always done.

The tribes have moved past litigation and work cooperatively with the state co-managers to implement Rafeedie's ruling. Tribal shellfish managers have developed harvest management and supplementation plans, and harvest data is collected and shared with other tribes and the state.

The Shellfish Settlement

While Rafeedie's ruling denied tribal access to half of all shellfish being grown on non-Indian commercial tidelands, it upheld the tribal right to harvest half of the naturally-occurring shellfish on those tidelands that would otherwise be available to the tribes. Tribal access to those shellfish, however, would be hugely disruptive and costly for commercial shellfish growers who had spent many years enhancing those tidelands, unaware of the treaty encumbrances.

Enacting the ruling proved difficult because the state and federal governments had allowed many of the best tribal shellfish harvest areas to be sold to private owners more than a century ago. Those purchasers were never told that the tidelands might be subject to tribal harvest.

"Fault for creating this controversy lies squarely within the state of Washington and the United States for selling the tidelands and not objecting to the sale, respectively," Rafeedie said.

Rather than spending years in court or trying to implement the conflicted ruling, the tribes and shellfish growers have developed an agreement to solve the impasse.

Under the agreement, the tribes would forego their treaty rights to harvest an estimated \$2 million worth of shellfish annually from commercial shellfish grower beds. Growers would provide \$500,000 worth of shellfish enhancement on public tidelands of the state's choosing over the next 10 years. Tribes would receive a \$33 million trust, with \$11 million in state funds and \$22 million in federal funds, to acquire and enhance other tidelands to which they will have exclusive access.

Both the state of Washington and U.S. Congress have endorsed the agreement. The state has already appropriated its financial share. Congress has passed legislation approving the settlement and authorizing an appropriation for the federal government's share.

Shellfish Management Case Study

Squaxin Island Tribe Boosts Recreational Shellfish Harvest

The Squaxin Island Tribe is boosting recreational oyster harvest by seeding several South Sound beaches. Over the past three years, the tribe has planted about 300,000 juvenile oysters for exclusive recreational harvest at public beaches in Mason, Pierce and Thurston counties.

The project is funded by tribal harvest of oysters on a remote stretch of beach on Oakland Bay near Shelton. “Typically, tribal and non-tribal shellfish harvesters share the harvest of oysters on a beach, but because of its remote location, few recreational harvesters make it out there,” said Eric Sparkman, shellfish biologist for the tribe. “That is why the tribe is harvesting both shares on the Oakland Bay tideland and then replacing the non-Indian share by enhancing shellfish beds that are more accessible to recreational harvesters.”

The three public beaches enhanced by the tribe are Frye Cove county park on Eld Inlet, the North Bay tidelands in Mason County and Kopachuck State Park near Gig Harbor. The project is part of a shellfish management agreement between the tribal and state co-managers.

“More than 5,000 people visit Kopachuck State Park annually, making it the second most popular public shellfishing beach in southern Puget Sound,” said Alex Bradbury, shellfish biologist with the Washington Department of Fish and Wildlife. “Frye Cove gets almost 1,500 sport harvesters annually and they took more than 14,000 oysters last year. This enhancement by the tribe will satisfy that huge sport demand for oysters at the most accessible public beaches.”

When it comes to shellfish harvest, tribal members aren’t bothered by the relative remoteness of a tideland. “We’re more worried about the health of a particular shellfish population, whether it can sustain harvest, than how easy or difficult it is to access,” said Andy Whitener, natural resources director for the Squaxin Island Tribe.

By reducing oyster populations in Oakland Bay, the tribe is also creating more space for clams to grow. “Oakland Bay is a better place for clams than for oysters, because the habitat is more suited for clams,” said Sparkman. “The clams thrive once they are alone on the Oakland Bay tideland.”

“We’ve been harvesting shellfish here for centuries,” added Whitener. “As co-managers, we’re interested in continuing that tradition so that all of us, tribal and recreational harvesters, can have access to strong shellfish populations.”



Will Penn, Squaxin Island Tribe resource technician, prepares to spread a bag of Pacific oysters in the shallow waters of Eld Inlet in southern Puget Sound. *NWIFC: E. O’Connell*



Brent Ramsey, Quileute fisheries technician, gathers water quality data off the mouth of the Quillayute River at LaPush.

NWIFC: D. Preston

Coordinated Tribal Water Resources Program

The treaty Indian tribes in western Washington partnered with the Environmental Protection Agency (EPA) 16 years ago to create and implement a nationwide model of cooperation and creativity in addressing water quality issues under the Clean Water Act. Today, building on the success of that initiative, these same tribes are embarking on a new partnership with the U.S. Geological Survey (USGS) to expand the Coordinated Tribal Water Quality Program into a Coordinated Tribal Water Resources Program.

While much has been accomplished in the area of water quality, the treaty Indian tribes and their Northwest Indian Fisheries Commission (NWIFC) have identified the need for a comprehensive assessment of water resources in western Washington as the basis for the informed management of those resources. In western Washington, climatic changes and urban development are having profound effects on water resources and aquatic ecosystems. This situation will worsen with an expected doubling of the population in the Puget Sound region over the next 20 years.

Judicious management of water resources and protection of tribal rights requires information about the quantity and quality of water available in western Washington. The assessment will produce scientific information on water resources that could be used to support a variety of tribal water resource management, administrative and legal activities, including:

- ◆ Establishing instream flows to sustain viable and harvestable populations of fish;
- ◆ Identifying limiting factors for salmon recovery;
- ◆ Protecting existing ground and surface water supplies;
- ◆ Reviewing and evaluating administrative decisions (for example, proposed water permits and instream flows) and project proposals on- and off-reservation; and
- ◆ Participating in federal, state and local planning processes for water quantity and water quality management.

Partnership with USGS

The treaty Indian tribes in western Washington have partnered with the USGS to develop a cooperative scientific framework for a comprehensive assessment of water resources in western Washington. The assessment will support tribal water resources management by evaluating water availability, out-of-stream uses of water by tribal and non-tribal parties, and water requirements for ecosystems in western Washington.

As a federal agency located in the Interior Department, USGS has a trust responsibility to tribal governments. They are also the preeminent authority among governments for instream flows. They can provide valuable expertise, supervision and guidance to the tribal effort.

Since the 19th century, water resources in western Washington have been the subject of extensive scientific investigation by tribal, federal, state, and local government agencies, public utilities and private interests. Despite this recent history of investigations, data collected through these efforts are not readily available to inform current management activities. Many of the investigations were motivated by a specific local concern such as locating a dam to generate hydroelectricity, determining instream flows for a specific reach of a river, or assessing water use for a municipality.

Although some investigations have integrated information about the availability and use of water sources for specific basins or sub-basins, this information has not been comprehensively compiled for western Washington. A tribal water resources assessment will collect available information on the region's water sources, quality and uses. Existing and new information systems will be used to make the information readily available to tribal water resources managers.

In addition to providing a comprehensive perspective on water resources in western Washington with existing information, the assessment will identify information gaps and approaches for filling them. A primary objective of the assessment will be to identify where additional monitoring, surveys or focused studies are needed to improve the initial characterization of water resources in western Washington.

The tribes have shown, through their work with EPA in the Coordinated Tribal Water Quality Program, how a strong working relationship can also be developed with USGS. The tribal/EPA effort has improved relationships, thereby enhancing the success of ecosystem management. Additionally, the tribal/EPA model program has produced transferable tools that can be shared with tribes throughout the nation. These tools include:

- ◆ Routine coordination and networking among tribes, state agencies and EPA;
- ◆ A coordinated tribal water quality database design and structure;
- ◆ A tribal water quality standards template;
- ◆ A Coordinated Tribal Water Quality Program design manual; and
- ◆ A cooperative state/tribal 303(d) strategy.

Much of this cooperative approach and work can be utilized in the water assessment effort. A unified tribal commitment and call for data will be the foundation of collecting and compiling the most important assessment of this region's water resources ever developed.

By embarking on this effort, tribes and the USGS would initiate a shift in the region's water discussions from one of speculation and politics to one of substance and purpose. Successful completion could support meaningful dialogue and partnership development to address flow setting, water conservation and growth.



Water Resources Case Studies

Puyallup Tribe Improves Water Quality Standards

The Puyallup Tribe of Indians is upgrading the water quality standards within its nearly 20,000-acre reservation, including the lower three miles of the Puyallup River. “Every community in the Puyallup River watershed benefits from clean water,” said Bill Sullivan, natural resources director for the tribe. “Clean water is not only important for wildlife and salmon, but for everyone.”

The tribe depends on clean water in the same way that any other community does, as a source of drinking water. The tribe also depends on clean water to support its traditional way of life.

The new standards will be a substantial improvement over the tribe’s original 10-year-old rules. “Water quality standards are the most basic tool we use to protect water,” said Sullivan. “By making sure these rules are up-to-date and based on the best science, we can take care of the water.”

The Puyallup Reservation is one of the most urban reservations in the country. “The water on the Puyallup Reservation faces just about everything you can throw at it, short of a nuclear reactor,” said Sullivan. “These standards will help us ensure that, at the very least, our water quality doesn’t get any worse.” Built into the standards is an enforceable anti-

degradation policy, a way for the tribe to ensure that future actions on the Puyallup River don’t do any additional harm.

The tribal water quality standards also are unique because they designate all the surface waters within the reservation as waters of “exceptional cultural significance.” While these waters are under one of the highest levels of protection, they allow flexibility for discharges associated with restoration or other beneficial activities.

An amendment to the federal Clean Water Act in 1987 encouraged tribes to write water quality standards. Under the same law, tribal water quality standards and those written by states have the same authority.

The tribe, along with the state of Washington, co-manages natural resources in the Puyallup River watershed. “The Puyallup Tribe has a long track record of responsible natural resource management,” said Sullivan. “These improved standards are simply a continuation of that tradition.”

The Puyallup Tribe’s new water quality standards protect tribal members, who depend on salmon as a food source. *NWIFC: E. O’Connell*

Tribe Tracks Pollution's Spread

For the past two summers, bacteria levels have risen mysteriously in Oakland Bay. By conducting a circulation study of the bay, the Squaxin Island Tribe hopes to confirm how tidal currents spread upland pollution.

“The increase in bacteria during the summer months is unusual,” said John Konovsky, environmental program manager for the Squaxin Island Tribe. “Typically, pollution spreads when it rains, but here we are trying to figure out what happens in the summer.” Oakland Bay is the nation’s leading source of manila clams and the center of the Squaxin Island Tribe’s shellfish culture and economy.

Using drogues – weighted buoys pulled along by currents – tribal staff can determine how upland pollution is carried to different parts of the bay. Global Positioning Systems (GPS) devices are attached to the drogue buoys, so their movement can be precisely tracked and plotted.

In addition to the circulation study, the tribe is working with the federal government to track pollution sources by using DNA. Each source of fecal coliform bacteria, whether human or animal, can be determined through DNA analysis. “By tracking the DNA in the pollution, we can determine if it’s human waste coming from failing septic systems, or some other source, such as farm animals,” said Konovsky.

Several shellfish beds in Oakland Bay are likely to close if nothing is done to stem the flow of pollution. “We’ve learned from other areas that once a shellfish bed is closed to harvest, it is very hard to get it open again,” said Andy Whitener, natural resources manager for the tribe.

In addition to being the most productive shellfish area for the tribe, Oakland Bay also provides jobs to many in Mason County. Several shellfish growers are among the top employers in Mason County.

“Oakland Bay is very important to the tribe, both economically and culturally,” said Whitener.



Squaxin Island Tribe environmental program personnel deploy a drogue in upper Oakland Bay to track how currents spread pollution. *NWIFC: E. O’Connell*



Quinault Indian Nation wildlife technician Kenny McCoy and wildlife enforcement officer Stacey Squiemphen pour water on a tranquilized elk that will be tagged and tracked as part of the QIN elk management plan. The water helps keep the animal's temperature low during the process. *NWIFC: D. Preston*

provides important nutrition to Indian families on reservations where unemployment can run as high as 80 percent. As traditional foods, deer, elk and other wildlife remain important elements of feasts for funerals, naming ceremonies and potlatches. Hides, hooves, antlers, feathers and other wildlife parts are still used for traditional ceremonial items and regalia.

Unfortunately, the quality and quantity of wildlife habitat is declining rapidly in western Washington. Where virgin forests once stood there is now urban sprawl. Deer and elk herds have been squeezed into smaller and smaller areas of degraded and fragmented habitat.

Concurrently, the ability of tribes to exercise their treaty-reserved right to hunt on open and unclaimed lands has also been dramatically impacted. Tribal members have been forced to hunt farther and farther from home to harvest their treaty-reserved share of wildlife resources.

Overlaid on this background has been a series of legal skirmishes as well as state and federal court rulings, most of them favorable to the tribes, addressing tribal treaty hunting rights.

The treaty Indian tribes in western Washington, as responsible co-managers of the wildlife resource, work cooperatively with the state of Washington, citizen groups and others to manage the wildlife resources. However, the tribes face continual challenges to their treaty hunting rights.

Wildlife Management

Wildlife resources have always been central to the cultures of the treaty Indian tribes in western Washington. Elk, deer, waterfowl and other wildlife have long provided a source of food and clothing for Indian people.

As with salmon and shellfish, the tribes reserved the right to harvest wildlife in treaties with the U.S. government:

“The right of taking fish at all usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the Territory, and of erecting temporary houses for the purpose of curing, together with the privilege of hunting and gathering roots and berries on open and unclaimed lands...”

-Treaty of Point Elliott, 1855

Little has changed over the centuries. The ancient link between the tribes and wildlife remains strong. Wildlife still

State and federal courts have consistently upheld the right of treaty tribes to hunt on open and unclaimed land, free of state regulation. The courts have generally ruled that lands such as national forests, which are not incompatible with hunting, are open and unclaimed. Further, the courts have ruled that to apply a state regulation to a tribal member with a treaty hunting right, the state must prove that the regulation is both reasonable and necessary for conservation purposes.

In 1999, the U.S. Supreme Court upheld the tribal treaty right to hunt on state lands free of state regulation in *Minnesota v. Mille Lacs Band of Chippewa Indians*. The ruling stemmed from hunting, fishing and gathering rights reserved by the tribe in an 1837 treaty with the U.S. government.

The Washington State Supreme Court made a similar ruling in 1999 in *State v. Buchanan*. The case involved a member of a treaty tribe charged with harvesting two elk during a closed season at the state-owned Oak Creek Wildlife Area. Two lower courts ruled Buchanan was simply exercising his treaty-reserved right to hunt on open and unclaimed land when he harvested the two elk.

The state Supreme Court ruled that treaty tribes may hunt within original tribal lands and traditional areas and also ruled that the state-owned Oak Creek Wildlife Area was open and unclaimed land within the meaning of the treaties. The court threw out the state's argument that the treaty hunting right was eliminated when Washington became a state. As in the *Mille Lacs* case, the court said that only the U.S. government may abrogate a treaty right.

While tribes prefer to cooperate with the state of Washington in the implementation of their treaty hunting rights and responsibilities as co-managers of the wildlife resources, they realize that they may be forced to seek a clarification of their treaty hunting rights through the federal courts.

Principles of Tribal Wildlife Management

The treaty Indian tribes in western Washington have a long history of co-managing natural resources with the state of Washington. The tribes and state have had numerous successes in implementing cooperative natural resource management efforts to protect, restore and enhance the productivity of natural resources in Washington.

In a recent policy decision, the Washington Fish and Wildlife Commission recognized that “the preservation of healthy, robust and diverse fish and wildlife populations is largely dependent on the state and tribes working in a cooperative and collaborative manner.”

It is important to understand that tribal hunters do not hunt for sport. Hunting is a spiritual and personal undertaking for each hunter. All tribes prohibit hunting for commercial purposes.

Western Washington treaty tribal hunters account for a very small portion of the total combined deer and elk harvest in the state. According to statistics for 2005-2006, tribal members harvested only 1,072 deer and elk – while non-Indians took 48,457, almost 50 times more.

Most tribal hunters do not hunt only for themselves. The culture of tribes in western Washington is based on extended family relationships. A tribal hunter usually shares his game with several families. In some cases, tribes may designate a hunter to harvest one or more animals for elders or families who cannot hunt for themselves.

As a sovereign government, each treaty tribe develops its own hunting regulations and ordinances governing tribal members. Each tribe also maintains an enforcement program to ensure compliance with tribal regulations. As responsible managers, tribes know the value of enforcement as a management tool. Tribes have had to limit hunting opportunities for tribal members when, because of budgetary constraints, they lack resources to adequately enforce their regulations. The ratio of tribal enforcement officers to treaty hunters is higher than the ratio of state enforcement officers to non-Indian hunters.

Like the state of Washington, tribes set seasons based on sound biological information about the ability of the resource to support harvest. Before opening any area to hunting, many tribes forward their regulations to the Washington Department of Fish and Wildlife for review and comment. Tribes also share their harvest data with the agency.

Enforcement, Education

Tribal hunters are licensed by their tribes and must obtain tags for each big game animal they wish to hunt. If a hunter is successful, he must tag the animal and submit a harvest report to the tribe. If a hunter is unsuccessful, he must report that result anyway, which yields valuable data for state and tribal wildlife managers. Tribal members are required to report all attempts at harvest. All tribal hunters carry photo identification cards that include their name, date of birth, tribal affiliation and other information.

If a tribal member is found in violation of tribal regulations, he is cited into tribal court. Penalties can include fines and loss of hunting privileges. In most cases, tribal hunting regulations address the same harvest and safety concerns as state rules, such as prohibiting the carrying of loaded firearms in vehicles.

A number of tribes conduct hunter education courses, aimed especially at young tribal members, to ensure their hunters are safe when exercising their treaty right. Students are taught how to handle firearms, ethical considerations and the reasons behind tribal hunting regulations. Cultural aspects of hunting, as well as treaty hunting rights, also are covered in the classes.

Collectively, the tribes have created the Inter-tribal Wildlife Committee of the Northwest Indian Fisheries Commission (NWIFC) to provide a forum for addressing inter-tribal issues. The committee also provides a unified voice in discussions with state and federal wildlife managers.

Wildlife Management Case Study

Black-tail Fawns Part of Deer Disease Study

Indian and non-Indian harvest of black-tail deer on the North Olympic Peninsula has dropped by two-thirds between 1992 and 2003. Makah wildlife biologists believe that a parasite-induced hair loss disease called hair slip syndrome (HSS) is responsible for reducing the productivity of black-tail deer and harvest opportunities.

To test that theory, the tribe has radio-collared 50 black-tail deer fawns last spring both on-reservation and on private timberlands in the Seiku and Sooes river watersheds. The fawns will be tracked for up to four years, which will include two reproductive cycles. HSS is caused by a non-native louse infestation that results in deer licking and scratching incessantly. The resulting hair loss reduces the animal's ability to regulate its body temperature, causing hypothermia, stress, exhaustion and even death.

Total Indian and non-Indian harvest of black-tail deer on the North Olympic Peninsula dropped from 963 to 302 in 11 years. Black-tail deer are vitally important to Makah subsistence and ceremonial needs. The sharp population drop led to the Makah tribal council designating black-tail deer as a species of concern.

"It's been established that close deer-to-deer contact seems to spread the disease," said Rob McCoy, wildlife division manager for the Makah Tribe. "We're trying to determine the impact HSS has on the overall population. Previous tribal studies have shown that about one-fourth of the black-tail deer in the study area have the disease. Comparing the productivity of deer that develop the disease to those that do not over the four-year period will tell us whether the disease is suppressing overall population growth."

HSS is more common with females than males. Following breeding season, the bucks generally become loners while groups of does and fawns will congregate together, said McCoy. Normally, most fawn deaths occur in the first months of life when they can't escape predators. Mortalities decline sharply as they get older. Those infected with HSS, however, frequently die later in their first year when overall fawn mortalities should be dropping.

Fawns collared as part of the study are carefully handled to minimize human scent and possible rejection by their mothers. "We have an established handling protocol. We observed all of the fawns back with their mothers by the following day and often before we were out of the capture area," said Jon Gallie, wildlife biologist for the Makah Tribe.

KBH Archers, a Bremerton-based sports group, private timberland managers Green Crow and Washington Department of Fish and Wildlife assisted with the fawn capture.

The Makah tribal council provided \$10,000 for the collars, and a \$25,000 federal Bureau of Indian Affairs grant provided for wildlife technician time and some supplies.



Tony Pascua, left, and Jeremiah Johnson, Makah wildlife technicians, prepare to measure, weigh and radio-collar a black-tailed deer fawn as part of the tribe's study on hair slip syndrome. *NWIFC: D. Preston*



Jason Norton, NWIFC fisheries biologist, brings a load of the Quileute Tribe's summer chinook to the coded wire tagging trailer where each fish will receive a tag that can be recovered when the fish return as adults. NWIFC: D. Preston

NWIFC FY 2006 Overview

"We, the Indians of the Pacific Northwest, recognize that our fisheries are a basic and important natural resource and of vital concern to the Indians of this state, and that the conservation of this natural resource is dependent upon effective and progressive management. We further believe that by unity of action, we can best accomplish these things, not only for the benefit of our own people, but for all of the people of the Pacific Northwest."

– Preamble to the NWIFC Constitution

The Northwest Indian Fisheries Commission (NWIFC) was created in 1974 by the treaty Indian tribes in western Washington as a result of the *U.S. vs. Washington* litigation that affirmed fishing rights reserved by the tribes in treaties signed with the federal government in the 1850s.

The commission's role is to assist the tribes in conducting biologically sound fisheries and to provide member tribes with a single, unified voice on fisheries management and conservation issues. Member tribes are: Nisqually, Squaxin Island, Puyallup, Jamestown S'Klallam, Port Gamble S'Klallam, Lower Elwha Klallam, Skokomish, Swinomish, Sauk-Suiattle, Upper Skagit, Tulalip, Stillaguamish, Muckleshoot, Suquamish, Nooksack, Lummi, Quinalt, Quileute, Makah and Hoh.

The tribes select commissioners who develop policy and provide direction to NWIFC staff. The commissioners elect a chairman, vice-chairman and treasurer. The commission's executive director supervises the staff that implements the policies and fisheries management activities approved by the commissioners. The NWIFC is a support service organization that provides direct services to member tribes to assist them in their natural resource management efforts. These services are provided through an economy of scale that enables tribes to efficiently use limited federal funding provided for their natural resource management activities.

The NWIFC employs about 65 full-time employees in its administration, fishery, policy analyst, wildlife, and information and education programs. The NWIFC is headquartered in Olympia, Wash., with satellite offices in Forks, Mount Vernon and Kingstons.

Growing concern about the declining health of the marine environment along the Washington coast and Puget Sound and its relationship to ongoing salmon recovery efforts were among the many important issues addressed in FY 2006 by the treaty tribes and their NWIFC. The year was also marked by anticipation of federal approval for a recovery plan for threatened Puget Sound Chinook and preparation for renegotiation of management plans for several species under the U.S./Canada Pacific Salmon Treaty. These and many, many more issues were confronted by the tribes against the backdrop of declining federal funding necessary to ensure that tribes are active partners in the collaborative approach that epitomizes how natural resources are managed in the region.

Recovery of Threatened Puget Sound Chinook

After nearly six years of intense work through the Shared Strategy process, a recovery plan for Puget Sound chinook that meets federal Endangered Species Act (ESA) requirements has been delivered to the National Marine Fisheries Service (NMFS), the federal agency charged with implementing the ESA. The endorsement and participation of NMFS in the Shared Strategy process has been critical to the plan's success. The tribal and state co-managers are awaiting final approval of the overall plan, even as elements of the plan, such as harvest management, have been determined to meet ESA requirements and are being implemented.

The Shared Strategy's 10-year trajectory for recovery of Puget Sound chinook integrates harvest, hatcheries and habitat in a recovery plan built on three strengths:

- ◆ Needs of people and fish are addressed together.
- ◆ The plan is built on the foundation of 14 watershed planning areas across Puget Sound and contains a tailored approach to recovery based on local characteristics and conditions.
- ◆ While the plan focuses on chinook, it is designed with the entire ecosystem in mind, as well as the environmental and biological processes that create healthy places for salmon.

The regional policy committee that guided development of the recovery plan has further expanded its membership and is now known as the Puget Sound Salmon Recovery Council. The council has grown from 22 to 34 members and includes representatives from each of the 14 watersheds in Puget Sound, as well as additional state, federal, environmental and business members. The group's first task is to develop a regional funding allocation strategy based on watershed priority plans and recovery goals.

Renegotiation of Pacific Salmon Treaty Chapters

Tribal and NWIFC staff also spent much of 2006 preparing for renegotiation of several "chapters," or long-term management plans, for chinook, coho and chum stocks jointly managed and shared under the Pacific Salmon Treaty between the United States and Canada. The treaty, implemented in 1985, is designed to help both countries achieve conservation goals and reap the benefits of their enhancement and restoration efforts for stocks that migrate between the two countries.

Of particular importance for the upcoming renegotiations is the need to ensure that the coastwide chinook management chapter meets standards under the ESA to ensure recovery of listed Puget Sound chinook.



Efforts To Fund Tribal Involvement In Forest Management

In an era marked by steadily decreasing federal funding for tribal natural resource management needs, the treaty tribes and NWIFC worked to obtain funding to enable the tribes to be active participants in the cooperative, collaborative approach to natural resource management that epitomizes the region.

NWIFC Chairman Billy Frank Jr., a Nisqually tribal elder, is a key participant in many cooperative natural resource management efforts in western Washington. *NWIFC Photo*

One focus of FY 2006 was securing adequate funding for tribes to fully participate in implementation of the 50-year Forest Practices Habitat Con-

servation Plan, also called the Forests and Fish Habitat Conservation Plan, or FFR HCP. The FFR HCP, signed in June 2006, covers 60,000 miles of streams on 9.3 million acres of forestlands that are home to species listed under the ESA. The FFR HCP was developed by tribal, local, state and federal governments and forest landowners.

An HCP is a long-term land management plan authorized under the ESA. HCPs are designed to reduce conflict and encourage collaborative cooperation between resource managers and the private sector. To be effective, all of those affected by the HCP must be full partners in its implementation. In particular, tribes need adequate funding to participate in the adaptive management process that guides the resource objectives for the HCP. The adaptive management approach requires comprehensive scientific research and monitoring to determine whether resource objectives are being met.

FY 06 NWIFC Activities

Fishery Management and Planning

The primary objective of the Fishery Management and Planning Division is to provide technical assistance and coordination to member tribes in their annual and long-range fishery management planning activities. Activities included:

- ◆ Long-range planning, wild salmon recovery efforts and ESA implementation;
- ◆ Development of pre-season fishing agreements;
- ◆ Development of pre-season and in-season run size forecasts;
- ◆ In-season fisheries monitoring; and
- ◆ Post-season fishery analysis and reporting.

Quantitative Services

The Quantitative Services Division's objective is to assist tribal fishery management programs by providing relevant data, quantitative tools and analyses, and technical consulting services to tribal and NWIFC projects. Activities included:

- ◆ Administering and coordinating the Treaty Indian Catch Monitoring Program;
- ◆ Providing statistical consulting services;
- ◆ Conducting data analysis of fisheries studies and developing study designs; and
- ◆ Updating and evaluating fishery management statistical models and databases.

Enhancement Services

The Enhancement Services Division provides tribal support services in enhancement planning, hatchery coordination, coded wire tagging and fish health. Activities included:

- ◆ Coded wire tagging of 4 million fish at tribal hatcheries to provide information critical to fisheries management;
- ◆ Providing genetic, ecological, and statistical consulting for tribal hatchery programs; and
- ◆ Providing fish health services to tribal hatcheries.

U.S./Canada Pacific Salmon Treaty Implementation

The Pacific Salmon Treaty of 1985 provides for tribal representation at all levels of the Pacific Salmon Commission, which implements the treaty. NWIFC staff are involved in many aspects of the treaty's implementation. Activities included:

- ◆ Facilitating inter-tribal and inter-agency meetings, developing issue papers and negotiation options;
- ◆ Serving on the Fraser sockeye and pink, chum, coho, chinook, and data-sharing technical committees, as well as other work groups and panels; and
- ◆ Coordinating tribal research and data gathering activities associated with implementation of the Pacific Salmon Committee.

Habitat Services

The Habitat Services Division provides coordination, representation and technical assistance to member tribes on fish habitat and other environmental issues. The division monitors these issues and acts as an information clearinghouse. Activities included:

- ◆ Coordinating policy and technical level discussion between tribes and federal, state and local governments, and other interested parties;
- ◆ Coordinating, representing and monitoring tribal interests in the Timber/Fish/Wildlife Forests and Fish Report process, Coordinated Tribal Water Quality and Ambient Monitoring programs; and
- ◆ Implementing the Salmon and Steelhead Habitat Inventory and Assessment Project.

Information and Education Services

The Information and Education Services Division provides comprehensive public relations and educational services to member tribes. Activities included:

- ◆ Producing news releases, newsletters, brochures, reports, curricula, videos, photographs, exhibits and maintaining a Web site to educate the public about tribal natural resource management activities and objectives;
- ◆ Producing newsletters, background papers and other materials;
- ◆ Responding to hundreds of public requests for information about the tribes and their tribal natural resource management activities; and
- ◆ Monitoring state and federal legislation and coordinating tribal input.