

Northwest Indian Fisheries Commission **NEWS**



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At The Confluence Of The Centuries

By Billy Frank Jr.
NWIFC Chairman

The confluence of the centuries should be like the joining of two rivers. As they merge, the memories of countless moments and places should fold one onto another, and form a deeper, broader flow of knowledge.



As the 19th Century merged into the 20th, my father was a young man. He lived his whole life on the Nisqually River. He was born in a wooden longhouse to parents who had lived on the same river throughout their lives. The heritage of the Nisqually has been passed from generation to generation for thousands of years. As my father grew, he learned to fish, hunt and gather everything from cedar bark to a multitude of wild fruits and vegetables. He learned the legacies of stewardship.

As he aged, things began to change. More and more non-tribal people settled here and over-exploited the natural resources. Settlements bloated into towns and then cities. Trails swelled into roads and then super highways. Old growth forests disappeared. Waterways were dammed. Pollutants poured into the rivers and belched into the air. People moved here by the thousands and then the millions.

I must ask myself, what kind of world will my sons inherit in the years to come?

Researchers tell us that the ocean will rise several inches over the next 50 years, and that its temperature will increase by several degrees.

There's a hole in the ozone layer. Exotic species of predators are invading our waters. We're told that there will be another million people here over the next 20 years and ground is still being lost to urban sprawl.

At the close of the 20th Century, I am striving to help teach my sons all I can of our heritage. I'm doing this because I know it is their link to their traditional home on the Nisqually, and their very existence as Indians.

As Nisquallies, they will walk the same path their grandfather and I have walked. They respect the environment of their world. They know that sustenance comes from the land. They understand the value of long-term vision. They realize the value of passing their heritage along to their children. They know what it is to be Indian, and to work hard to help others understand our values. If non-Indians can learn to value the heritage of this land, and to teach these things to their children, there is hope that my grandchildren will see a better life at the confluence of centuries to come.

On the cover: Quileute tribal fisherman Terry Jones tends his net while fishing for coho near the mouth of the Quillayute River on a sunny morning in late October. *Photo: D. Preston*

Northwest Indian Fisheries Commission News

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Normally Plentiful Fall Chum Scarce

News of poor returns of spawning salmon is commonplace in western Washington these days.

But Hood Canal fall chum? A fish so plentiful that the Skokomish Indian Tribe usually can't give enough of the big salmon away? It appears flooding four years ago and perhaps a deterioration in ocean survival conditions have brought the mighty Hood Canal fall chum run down to earth for the time being.

Estimates in recent years of the average fall chum run into Hood Canal – both hatchery and wild fish – run anywhere from half a million to nearly one million fish, and harvests are usually in the hundreds of thousands. Last year, more than 300,000 chum were taken in treaty and non-treaty fisheries. But nearing the end of this fall's run, fewer than 70,000 chum had been harvested from both treaty and non-treaty commercial fisheries in Hood Canal, pointing to an overall return that will likely be a fraction of what was predicted.

To the Skokomish people, the fall chum crash meant more than lost fishing income. Dave Herrera, Skokomish fisheries manager, said the tribe will also fail to meet its hatchery needs for brood eggs, and won't be able to provide surplus fish for tribal members for smoking or crab bait.

"Our hatchery has collected about 1.5 million chum eggs this year," Herrera said. "Normally, we'd be right around three million eggs. It's so bad down here that we're having to go to the Quilcene National Fish Hatchery and bring back carcasses to hand out to people on the reservation."

The tribe's solid relationship with the crew at the Quilcene hatchery, operated by the U.S. Fish and Wildlife Service, paid off this year. Hatchery officials there are donating several hundred thousand fertilized chum eggs to the tribal hatchery. In mid-December the two crews worked together to spawn the last portion of the chum run. If routine laboratory testing for a host of viruses come back negative, the "eyed" eggs will be transferred to the Skokomish's Enetai hatchery for rearing and eventual release.

Poor chum returns weren't limited to Hood Canal. On Port Gamble Bay, near the canal's northern entrance, the Port Gamble S'Klallam Tribe was wondering what happened to its hatchery fish.

"We haven't had anything back since the second of the month," said Dennis DeCoteau, Port Gamble S'Klallam tribal hatchery technician in late December. "We've handled about 921 fish this season; last year we did about 5,000 chums."

DeCoteau said the Little Boston hatchery's usual egg take is about 1.2 million chum eggs; this year, the egg take



Deano Wilbur, Skokomish tribal hatchery manager, checks fall chum eggs donated by the Quilcene National Fish Hatchery. *Photo: D. Williams*

stands at about 680,000, and there's little likelihood that number will change.

Chum returns elsewhere in western Washington were average, with good escapements reported to Oakland Bay, Case Inlet, and other portions of southern Puget Sound, as well as in northern Puget Sound where wild chum runs on the Stillaguamish and Snohomish river systems were expected to meet or exceed preseason forecasts.

The so-so chum runs come after a mixed story for coho returns throughout the region. Good returns were reported along the Washington coast, but were "horrible" in southern Puget Sound, according to one fisheries manager. The Hood Canal coho fishery was also a bust, but biologists believe enough fish made it back for spawning purposes. In northern Puget Sound, catches well below expected levels were reported, but spawning escapements were within reach.

– *D. Williams*

After Natural Toxin Levels Close Beaches For Over A Year

Quinalts Return For Razor Clam Harvest

Lanterns glowed as Quinault Indian Nation members streamed to beaches on fall evenings to exercise their treaty right to harvest a traditional food source.

The beaches of the Olympic Coast provide Indian and non-Indian clam diggers an opportunity to harvest razor clams, but beaches there have been closed for more than a year due to high biotoxin levels in razor clams.

As co-managers of the resource with the State of Washington, the Quinault Nation provides a portion of the biotoxin monitoring, population assessment and harvest monitoring on which coastal razor clam harvests depend. Biotoxin sampling revealed it was finally safe for both Indian and non-Indian harvests in September.

Beaches at Kalaloch remain closed and those near Westport were closed recently due to high biotoxin levels. In general the health of clam populations in the Roosevelt, Copalis and Point Grenville areas are good, with toxins remaining below the closure guidelines, said Joe Schumacker, Quinault marine shellfish biologist.

“The toxin level has mostly stayed down in these areas and that’s been good for everyone. The populations we’ve sampled look good and healthy,” he said.

Clams are considered unsafe to eat if they contain 15 parts per million (ppm) or more of domoic acid. Some clams have registered as high as 200 ppm on Kalaloch Beach this past year. There is no evidence domoic acid harms the shellfish, just the people who eat them. Eating shellfish with high levels of domoic acid causes Amnesic Shellfish Poisoning (ASP). Symptoms can range from nausea, loss of short-term memory and even death.

The knowledge of the presence of domoic acid on the West Coast is fairly

recent. That’s because shellfish were not even tested for domoic acid until there were four deaths in eastern Canada in 1987 from eating mussels with very high levels of domoic acid. Testing for the toxin in all shellfish on the West Coast began in 1991.

“An ongoing discussion about domoic acid is whether it’s been in shellfish all along or not. Since we didn’t start testing for it until 1991 it’s hard to say,” Schumacker said. Additionally, the levels determined harmful to humans were based on the mussels that caused the deaths, not clams or crabs. That fact is important because each species of shellfish stores the toxin in different ways. For instance, crabs retain a great deal of the toxin in the viscera or guts. Even if the whole crab is too high in domoic acid, with proper



Quinault Nation members begin a commercial razor clam dig in the waning minutes of sunset on Roosevelt Beach area south of Taholah. *Photo: D. Preston*

care and processing the toxin level in the legs may meet health guidelines.

“Basically, a lot more research needs to be done,” Schumacker said. “Obviously we are all going to err on the side of caution. ASP is a serious concern. But it would sure be helpful for everyone if there was more information known about exactly what levels in what shellfish are problematic.”

In the meantime, Quinault Nation members are celebrating the return of razor clams to their diets and way of life.

– *D. Preston*



Hoping For A Big One

Young anglers crowded around the Quinault Nation’s Ocean Shores Marina in hopes of catching one of thousands of returning coho. In a joint project, the Quinault Indian Nation reared the coho from a Washington Department of Fish and Wildlife hatchery and released them at the marina, creating fishing opportunity for Indian and non-Indian fishermen.

Photo: D. Preston

Lorraine Loomis: Habitat Key To Salmon Recovery

Boldt
25
1974-1999

It has been 25 years since Judge George Boldt issued his landmark ruling in U.S. vs. Washington, which reaffirmed the tribes' treaty-reserved fishing rights and established the tribes as co-managers of the salmon resource. For the past year NWIFC News has been looking back to note the 25th anniversary of the Boldt Decision, as well as ahead toward the new millennium, with a series of interviews with tribal leaders. Lorraine Loomis, Swinomish tribal fisheries manager, is the subject of the final interview in the series.

Lorraine Loomis remembers the early days after the Boldt Decision as a busy time for the tribes and for her as she helped fishermen gear up, find fish and markets. The experience was invaluable to Loomis — not to mention those fishermen — as she rose from a fish processor in the early 1970s making \$1.60 an hour, to assistant plant manager at the Swinomish Fish Company. In 1975, she was selected fisheries manager for the Swinomish Tribe and has worked tirelessly for both the salmon resource and tribal fishers ever since.

“When the Boldt Decision came down, I worked for the Fish Company so I was more into helping the fishing fleet compared to the resource,” she said. “I helped write loan grants for new fishermen, helped with supply buying and finding good prices for nets and other gear. I made sure fishermen knew what was open and where and when they would be back into dock to sell. This all changed when I took over the fisheries manager’s job. I had to listen and learn for a lot of years from a lot of great fish people.”

Over those years, her experience and skills have been



Lorraine Loomis

put to good use by her tribe, the member tribes of Skagit System Cooperative (SSC), Northwest Indian Fisheries Commission (NWIFC), and beyond. In addition to her roles on the Tribal Senate and SSC board, Loomis has served as a commissioner on the NWIFC since 1978, including four years as commission vice-chair. She has been a respected member of the U.S. Fraser Panel, fighting on behalf of sock-eye fishing tribes, since 1985. She was chair of the U.S. Fraser Panel in 1999 and in several past years. She will serve as the chair of the bi-lateral Fraser Panel in 2000. Known as a highly effective tribal negotiator, Loomis is adept at consensus building while ensuring treaty rights are not trampled upon.

One of the ripple effects of Boldt was that the tribes gained considerable clout not only in managing state fisheries, but in managing international fisheries. Loomis is a key figure in U.S.-Canada negotiations and in fashioning Pacific Salmon Treaty (PST) agreements. These negotiations are designed to ensure conservation goals are met and that the countries and tribes reap the benefits of their own fisheries enhancement and restoration efforts.

‘If I didn’t believe that salmon would recover, I wouldn’t be in this job today.’

— Lorraine Loomis,
Swinomish Tribe

“Both countries need the PST,” Loomis said. “There needs to be good fisheries management on both sides of the border.”

Twenty-five years after Boldt, Loomis says declining salmon runs, magnified by the recent Endangered Species Act (ESA) listing of Puget Sound chinook, are the biggest threat to treaty fishing rights. SSC tribes are among those hoping ESA might finally crack down on poor land use practices, but also fear that fishing will continue to shoulder an unfair burden in salmon recovery.

“If I didn’t believe that salmon would recover, I wouldn’t be in this job today,” she said. “We will recover and we will again have a harvest.”

But before that happens, Loomis said, more stakeholders, particularly in the area of habitat, are going to have to step up to the plate in salmon recovery.

“The commercial harvesters have been cutting back their catch of salmon for years, even to closing most of their fisheries down,” she said. “All these closures have not brought the salmon back, so now it is imperative that we look at the habitat. Everyone must get into the act of rebuilding these stocks; everyone had something to do with the decline.”

—L. Harris

Sharing A Tribal Tradition

Nisqually Tribe Gives Away Thousands Of Salmon

Sharing the salmon is a tradition of the treaty Indian tribes in western Washington. Hundreds of military personnel, food bank recipients and the general public shared in that tradition recently at the Nisqually Tribe's Clear Creek and Kalama Creek hatcheries.

Over 5,000 chinook salmon averaging over 10 pounds each were given away at the tribal hatcheries in October after eggs and sperm from the returning adult salmon were obtained to produce more fish at the hatcheries. The free salmon were the result of a much larger than anticipated chinook return to the Nisqually River. About 30,000 adult chinook – nearly three times more than expected – returned to the Nisqually River this year. Even after good harvests by tribal fishermen and non-Indian anglers, the Nisqually tribal hatcheries were plugged with returning adult fish.

The salmon give-away has been quietly going on for years at the tribe's Clear Creek Hatchery located at the U.S. Army's Fort Lewis near Tacoma. But word quickly spread about this year's bumper crop of returning chinook, and lines swelled at the tribal hatcheries for the twice-a-week salmon distribution, which ran for about a month.

Lines began forming as early as 5 a.m. some days, with turnouts of up to several hundred people. After receiving their free fish, many quickly went back to the end of the line to wait for another.

"It is our tradition to share what we have with others," said Georgianna Kautz, tribal fisheries manager. "We are happy to be able to share these salmon with our friends and neighbors," she said.

"This is great that the tribe does this," said Andrew Rosenberg of the Rochester Food Bank, which serves southern Thurston County. "This will help a lot of people," he said as he loaded about 50 of the chinook into a pickup. Tribal members and food banks receive first priority for the surplus salmon.

Because of the large return, hatchery staff were able to easily obtain the several million eggs needed to produce more salmon at the Nisqually hatcheries. All together, 4.6 million eggs were taken from this year's chinook return to the Nisqually River.

"We are thankful for this great return of chinook," Kautz said. "Our hatcheries have plenty of eggs, our tribal fishermen and non-Indian sport fishermen all had good harvests, and we were able to give away salmon to many more people."

Good hatchery management practices and favorable

growing conditions in the ocean were the two main reasons for this year's excellent returns, said David Troutt, the tribe's natural resources director.

The tribe only uses eggs from Nisqually chinook in its hatchery operations, he said. "We don't import eggs from other hatcheries on other river systems. As a result, the fish produced at our hatcheries are well adapted to this environment and keep coming back stronger every year." – T. Meyer

Makah Find Unique Solution To Feed Hungry

Food bank clients in Puget Sound and as far east as Okanogan have been enjoying fresh fish courtesy of the Makah Tribe, Northwest Harvest, and Supreme Alaska Seafoods Inc., through a unique solution to a common fishing problem.

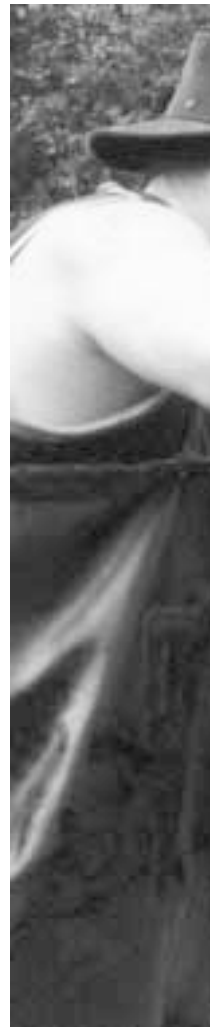
Pacific whiting are used for many purposes, including imitation crab meat. In the whiting fishery, like other fisheries, there is sometimes an unintended bycatch of other species. In this case, yellowtail rockfish are sometimes caught along with the whiting. The National Marine Fisheries Service (NMFS) wants to reduce bycatch in the whiting fishery because too much incidental harvest in that fishery means reduced quotas for those who fish specifically for yellowtail.

As part of their plan to reduce yellowtail bycatch, NMFS has required whiting processors to discard all yellowtail so that the incentive to sell the fish is removed. But for the Makah, wasting a food fish goes against their cultural directives.

"We were faced with a challenge," said Steve Joner, chief biologist for the Makah Tribe. "We wanted to reduce bycatch and find a way to utilize what we did catch. The question was how to satisfy NMFS and find a non-commercial way to utilize these fish."

Peninsula food banks that were contacted didn't have the resources to make use of the fish. Instead, they suggested Joner contact Northwest Harvest, a large Seattle-based non-profit organization that feeds the hungry.

Northwest Harvest collects and distributes food to approximately 270 hunger programs in Washington without tax dollars or fees of any kind. Last year, more than 17 million pounds of food was distributed to a monthly average of 454,173 people, but only about 2 million pounds of



Nisqually tribal m
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Makah Pride Continues To Grow Following Hunt

Eight months after the Makah Tribe successfully hunted its first whale in more than 70 years, their village of Neah Bay doesn't seem that different on the surface. Below the surface, however, is the increased pride of the village and their sense of re-connecting in a very personal way with their identity as a whaling people.

"Reflecting on what our tribe and our men have accomplished, we see a re-affirmation of our identity - our way of life," said Keith Johnson, Makah whaling commissioner and council member.

"In that reflection, we have found tremendous growth in individual families and as a tribe. We are moving forward and providing the opportunity for individual whaling families to participate in whaling," he said. "We look forward to the day when the time is right for the family to affect the hunt. They will decide that."

The tribe maintains a whaling management plan under a memorandum of agreement with the U.S. Department of Commerce and may take up to an average of five gray whales a year for five years under their quota.

The whales migrate along the Washington coast in spring and late fall, providing the two times of year the tribe can hunt.

"Most important of all was the exercising of our treaty right," Johnson said.

"It was meant to be. It couldn't have gone more perfectly," said Ben Johnson, Makah Tribal Chairman. "Tribes all over the country were watching us. I think it's one of the greatest things to happen in Indian Country. All of our young kids want to be whalers now," Johnson said.

As the community continues to discuss the hunt and prepare for the next, council member Grieg Arnold sees even more benefits 10 to 20 years down the road.

"I think about the bonding that is taking place and will continue to happen. It will be huge in the community in the future," Arnold said.

The Makah Tribe voluntarily stopped whaling more than 70 years ago after commercial whale hunters had driven many whale populations to near-extinction. Today, the gray whale population is more than 26,000, at or near historic levels.

"When we first embarked on this journey, our concern was whether we had the knowledge and ability in the community to do this. There was a lot of concern for the safety of our men. But we did it. We have made a spiritual connection to the past," said council member George Bowechop.

– D. Preston



Member Brandon Franklin, hefts a chinook for an excited recipient. The tribe gave away about 5,000 chinook in October. The annual salmon giving was quiet for about five years, but this year's better than expected and resulted in large turnouts for the surplus fish. Photo: T. Meyer

that was protein. Nearly half those served are children.

"We were thrilled to get this fish," said David Bobanick, resource development director for Northwest Harvest. "Protein is always in high demand when you are trying to help hungry people. Protein is also very expensive, so this fish has been a very welcome addition. Children need protein to develop and grow properly, yet many families can't afford the foods that contain protein," he said.

"This fish is also a high quality product. It has been really popular and widely distributed throughout the state."

Supreme Alaska Seafoods Inc., which processes the whiting at sea, donated the cost of processing the yellow-tail. "It's a big deal for them to do that, because it takes extra time to process these fish and of course they are bearing the cost," Joner said.

"This is a great outcome. I'm really glad that NMFS was willing to work with us on this problem. I think the solution has worked out really well for everyone," Joner said.

– D. Preston

Skokomish Tribe Seeks \$5.8 Billion in Damages

Claiming it has sustained 75 years of “ruthless economic and human damage” from the Cushman Hydroelectric Project, the Skokomish Indian Tribe has filed suit against the City of Tacoma and the federal government. The tribe seeks \$5.8 billion in damages as a result of lost economic revenue from fisheries, and other damages.

“For 75 years the United States has aggressively covered for Tacoma’s predatory practices. This makes a mockery of the regulatory process and of the rule of law,” said tribal chairman

Denny Hurtado. The tribe contends Tacoma obtained the federal license under false pretenses, in that it failed to fully explain that the tribe’s primary source of salmon and steelhead would be all but obliterated and its economy severely crippled.

The Cushman project was constructed on the North Fork Skokomish River three-quarters of a century ago. It was built without fish passages and diverted the majority of the river’s flow from its watershed. This not only led to the dewatering of the North Fork – home to the river system’s most productive fish habitat – but it also led to the huge flooding problems the tribe and other Skokomish River Valley residents still face every year.

“We want the water back in our river,” Hurtado said. “The only way we’re going to restore our river is to have all of the water put back into it.”

The city’s original license request from the Federal Power Commission was to flood 8.8 acres of U.S. Forest Service land on the North Fork, upstream of the Skokomish Indian Reservation. The city didn’t ask for, nor did the power commission grant, a license for any hydroelectric facilities.

Nevertheless, the city built two dams, two powerhouses, transmission lines, and other structures, and in 1930 began diverting all of the North Fork’s flow out of the watershed to a powerhouse on land the city had condemned within the tribe’s reservation. The original license’s 8.8 acres has since grown to a total project area of about 4,700 acres.

The tribe named the federal government in the suit because it failed to perform its trust duty to the tribe.

Economic studies commissioned by the tribe show that the city has made more than \$1.6 billion in net revenues from the Cushman Project since it went on-line in 1926, while the tribe has endured \$5.8 billion in damages from the project.



Skokomish tribal chairman Denny Hurtado: ‘We want the water back in our river.’ Photo: D. Williams

Removal Of Elwha Dams Moves Ahead

January 1, 2000 was an important date to many, but the Lower Elwha Klallam Tribe has its eye on Feb. 29. That’s when the federal government will formally acquire two fish-killing dams on the Elwha River and bring restoration of its ecosystem and salmon runs a giant leap closer.

“A lot has happened in just the last six months,” said Michael Q. Langland, river restoration coordinator for the tribe. “There’s no question that we’ve made positive steps.”

The latest turning point in a decades-long struggle filled with turning points came late this summer when Senator Slade Gorton (R-Wash.) withdrew his demand that any river restoration plans on the Elwha be linked with a promise from the Clinton administration that dams on the lower Snake River in eastern Washington not be altered in any way to aid salmon recovery efforts there.

Although Congress authorized river restoration, including dam removal, more than seven years ago, the plight of the Elwha has somehow failed to generate enough interest in Washington, D.C. to move ahead – until this year.

Current cost estimates for dam removal and river restoration are running at about \$122 million.

The Elwha River is the largest stream on the north Olympic Peninsula and has seen its once-impressive salmon runs slowly killed by the dams, which were built illegally without fish ladders.

Langland said that not only did the two dams cut off anadromous fish access to most of the river’s habitat, and degrade the remaining spawning habitat, but they have also increased erosion and flooding on the Lower Elwha reservation, and interfered with the reservation’s water resources.

– D. Williams

Tulalip Tribes Plan Native Plant Nursery

When the Tulalip Tribes have lacked native trees and shrubs to plant at large-scale salmon restoration projects, they've either purchased them from native plant nurseries or salvaged them from areas where land is being cleared.

Such salvage operations are usually effective, but even when small cedar, fir and other trees are available for salvage, the Tulalip Natural Resources Department has often had nowhere to hold them.

Also not easy to find are native trees like Western Yew and Ironwood. Tribal members need such hardwood materials for traditional cultural uses, such as fashioning bows and drum sticks.

"Harvest and land-clearing have really cut into the



Tulalip technician Gene Enick displays a salvaged cedar tree. Photo: L. Harris

materials you can find locally," said Tulalip tribal member Alan Cortez.

These two basic needs — trees for restoration projects and cultural purposes — spawned a good question at the Tulalip Natural Resources Department, said Environmental Director Daryl Williams: "Why not grow them ourselves?"

By next spring the tribes hope to be well on their way to building and maintaining a Pacific Northwest native plant salvage yard and nursery on the reservation.

"It's primarily aimed at restoration, but in many cases we would be growing the same species tribal members need for cultural purposes," Williams said.

Planting is a critical element in salmon habitat restoration, with vegetation providing shade to cool streams and cover from salmon predators, and large woody debris falling into streams and creating essential fish habitat.

Williams expects a nursery — reproducing plants native to Tulalip's usual and accustomed fishing areas — could provide not only wonderful benefits to tribal natural resources and cultural uses, but also to Tulalip economic development.

— L. Harris

Mt. Rainier Elk Herd Focus Of Study

Two elk herds inhabiting the southern slopes and valleys of Mount Rainier are a study in contrasts, and three western Washington treaty Indian tribes want to find out why.

One herd, dubbed the South Rainier Herd (SRH) by biologists, is thought to generally stay put in the Cowlitz River Valley. Its population has remained fairly stable over the years at about 1,500 animals.

Then there's the Mount Rainier National Park South Herd (MRNPSH). In the summer calving season, the herd spends its time as high as 6,500 feet on the slopes of Mount Rainier. When the snows of late fall arrive, the herd is believed to move down the mountain and winter along the Cowlitz River, mixing with the South Rainier Herd, as well as a herd from the Mount St. Helens area.

Unlike the SRH, however, the MRNPSH has seen a sharp decline in numbers over the past two decades. In the mid-1970s, the herd averaged about 400 animals. By the mid-1990s, it had shrunk by nearly half.

Hunting pressure, as well as increased cougar and bear predation are some of the possible causes of the herd's decline. There's also the possibility that, every year, a number of animals from the migratory MRNPS herd may quit their wandering ways and join up with the resident SR herd or the Mount St. Helens herd.

To answer these and other questions, the Puyallup, Nisqually and Squaxin Island tribes have teamed up to conduct a comprehensive study of the MRNPS herd. Information gathered from the study will be shared with the Washington Department of Fish and Wildlife, which will assist in the effort.

The first step in the study was completed recently when tribal biologists conducted three aerial surveys to update the herd's population trend. The next step will take place in February, when 30 of the herd's cows will be captured and fitted with radio transmitters and tracked periodically to determine the herd's range and migration patterns.

Funding for the \$200,000 project is provided by the Puyallup, Nisqually and Squaxin Island tribes, Administration for Native Americans, and Bureau of Indian Affairs.

It's been over 20 years since a comprehensive look has been taken at the MRNPS herd, said Michael MacDonald, the Puyallup tribal biologist heading up the project. Currently, little is known about the herd's population and migration trends.

"This project will help us determine what we, as managers, can do to help this herd thrive," he said. — T. Meyer

Better Management Aim Of Squaxin Island Tribe's Effort

Project Targets South Puget Sound Coho

Coho returns to southern Puget Sound have been on a long-term decline for years, and the Squaxin Island Tribe wants to find out why so that it can help improve management of the resource.

In addition to the naturally spawning coho produced by south Puget Sound streams annually, 2 million more hatchery-bred coho are reared and released annually from net pens operated by the tribe in cooperation with the Washington Department of Fish and Wildlife (WDFW). Despite that level of production, returns of both naturally spawning and net pen coho have fluctuated wildly while continuing a long-term downward trend.

Over the past decade, the tribe's average annual harvest has decreased 80 percent. In 1993, for example, only about 18,000 coho were harvested in the Squaxin Island Tribe's fishery. The following year, tribal catches jumped to nearly 119,000. In 1998, about 42,000 coho were harvested, but in this year the tribal harvest was just 4,000.

Conditions in the marine environment of Puget Sound are suspected to be one cause of the wide variations in coho returns. Higher water temperatures and lack of available food are two possible culprits.

It is the naturally spawning coho population, as the smallest and most vulnerable component of coho production in southern Puget Sound, that has fishery managers most concerned.

"We are looking at the distribution of naturally spawning coho in area and time within our fisheries to determine if we are able to provide additional conservation measures to further protect these fish," said Andy Whitener, assistant tribal natural resources director. One conservation measure long used by the tribe to protect naturally spawning coho is to prohibit fishing in inlets where the fish school before heading upstream to spawn, Whitener added.

Two years of the three-year tribal effort are being partially funded through a federal Saltonstall-Kennedy Grant that matches \$141,768 in tribal funding.

To identify strategies for improving production of naturally spawning coho in south Puget Sound watersheds, tribal biologists are collecting detailed data on the freshwater phase of the coho's life cycle.

Mill and Cranberry creeks near Shelton serve as indi-



Mike Henderson, Squaxin Island tribal member and a field supervisor for the tribe's natural resources department, gently releases a female coho to continue her spawning journey. *Photo: T. Meyer*

cators for the project. In the winter, adult coho returning upstream to spawn are trapped, measured, tallied and released. About 18 months later, their juvenile offspring migrating downstream are likewise captured and released to provide an estimate of overall production.

Fall tribal fisheries targeting returning adult net pen coho are sampled to estimate the composition of the tribal catch. The tribe's general fishing area is broken down into smaller units to determine catch composition at certain times and locations. Scale analysis tells biologists whether the coho are of naturally spawning, hatchery or net pen origin.

When the two parts of the study are combined, the tribe can estimate the current production level of coho in the creeks of extreme southern Puget Sound. The tribe also can estimate proportions of naturally spawning coho harvested in its fisheries for net pen coho.

"If, for example, we determine that a large number of naturally spawning adult coho tend to migrate through a certain area at a certain time, we can adjust fishing in that area for net pen coho until those fish have passed through," said Whitener.

The Squaxin Island Tribe is participating in a larger effort by tribes, WDFW, the National Oceanic and Atmospheric Administration, the University of Washington and others to better understand the relationship between coho production and possible changes in the marine environment of southern Puget Sound.

— T. Meyer

Effects Of Peak Flows On Salmon Egg Survival Studied

After finding just the right spawning gravels, and digging a little, a salmon redd, or egg nest is created.

The process happens every fall on Finney Creek and on many other Skagit River tributaries. The redds, however, are not normally plastic, gravel-filled boxes and the species doing the work isn't biologists and technicians.

But for the last two years, staff from Skagit System Cooperative (SSC) – the fisheries management consortium of the Swinomish, Upper Skagit and Sauk-Suiattle tribes – have placed artificial redds and scour chains in Skagit tributaries to learn more about how high, fast-moving water affects chinook salmon egg-to-fry survival.

The project is designed to give fish managers good information about how sensitive egg-to-fry survival is to changes in peak flows – for example, the extent to which spawning gravels are scoured away or egg nests are smothered with sediment – in specific spawning areas. Such information will help fish managers produce more accurate pre-season run-size forecasts – a critical element in setting abundance-based fisheries.

“Although the relationship between habitat and chinook escapement (the number of fish needed to return, spawn and perpetuate the run at a certain level) is poorly under-



Artificial salmon redds are handed to SSC Senior Restoration Ecologist Eric Beamer for placement in a Skagit River tributary. Photo: L. Harris

stood in most cases, the mortality associated with peak incubation flows does seem to have a major effect on juvenile chinook survival on the Skagit,” said Eric Beamer, senior restoration ecologist for SSC and the lead investigator for the project.

Perhaps most importantly, the data can help SSC target restoration actions to streams where peak flows produce the harshest impacts to survival.

For example, results may show that egg mortality for some spawning areas is most related to scour from an increase in peak flows, not changes in sediment supply. In this case, if the increase in peak flows is caused by natural cycles of rain and snow, no restoration action would be necessary. But if watershed analysis finds the cause is from something man is doing, then those issues would be targeted for restoration. If too much sediment is intruding on eggs, actions might include addressing forest roads to keep them from causing landslides.

“This study will help to draw the link that land use actually has some ef-

fect on the number of salmon available for harvest, and help define actions that might actually restore chinook stocks, rather than relying solely on harvest restrictions,” said Lorraine Loomis, Swinomish fisheries manager.

The artificial redds are essentially open plastic boxes with grating able to contain gravel but allow in sediment. They are installed where salmon redds are present. The boxes are retrieved throughout the incubation period after peak flow events. Any remaining boxes are retrieved when most fry have emerged. Once retrieved, the sediment is sieved to determine the amount of intrusion on eggs. SSC staff have installed more than 400 egg boxes in six different spawning areas.

Scour chains, essentially a cable string of whiffle balls staked directly into the streambed, monitor the depth of gravel movement and indicate whether the artificial redds have been exposed.

Combined with existing data on Skagit peak flows dating from the 1920s and research taking place on the North Fork of the Stillaguamish, a general model of chinook egg-to-migrant-fry survival was developed. The study has already produced some interesting conclusions.

For example, data shows that six different stocks of Skagit chinook and one stock of Stillaguamish chinook were unable to produce enough return spawners to replace themselves if peak flow during the egg incubation period was equivalent to a 20-year or larger flood event.

“Egg incubation survival limited chinook recruitment over 30 percent of the time, suggesting that the egg-to-fry life stage of the chinook life cycle can limit adult production even when flooding is not severe. Clearly, freshwater habitat conditions at the egg-to-fry life stage can be a bottleneck to production of chinook stocks,” said Beamer. “This information is important when considering how to protect and restore chinook.”

– L. Harris

Schell Ditch Becomes A Creek Once More

So transformed by agricultural land use were the stream banks of Schell Creek that the narrow Lummi Nation Reservation waterway flows by the title of Schell Ditch on many historical maps.



Continual dredging over decades transformed the creek into an agricultural drainage ditch, and a farmer even built a chicken coop over Schell Creek to collect and flush manure. Native trees and vegetation were removed to make way for farmland. Decades later the farm was abandoned and the stream's banks were overtaken by invasive blackberries and reed canary grass.

A Lummi Tribal School student receives help planting trees at Schell Creek. *Photo: L. Harris*

These are not fish-friendly impacts to be sure, and yet the Schell Creek location – just 1,700 feet from where it meets the Lummi River and about 1½ miles from where the river empties into Lummi Bay – is deemed critical habitat for young chinook, coho and chum salmon. Such lower river habitats are

considered essential nursery areas for salmon smolts making the transition from fresh to saltwater.

That's why the Lummi Nation and U.S. Fish and Wildlife Service (USFWS) have joined forces to improve fish and wildlife habitat at Schell Creek.

Lummi Nation, which dedicated 100 feet along either side of the creek to environmental restoration, is using funds from the Jobs in the Woods program of the USFWS to pay for the project. The work itself has involved removing fill dirt, concrete buildings and debris. Stream banks were re-

shaped, soils improved, and trees and shrubs planted.

About 40 children from Lummi Tribal School helped plant Douglas fir, alder, and other native plants in October. The children are adopting the site as a school project.

“By working together, the results from habitat restoration projects will multiply and dramatically improve the overall chances to recover salmon in the Nooksack River,” said Merle Jefferson, Lummi natural resources director.

— L. Harris



Homeward Bound

A coho salmon leaps the falls above the Quinault Indian Nation's Salmon River hatchery. Coastal coho returns were good. Clear fall weather provided increased fishing opportunity. *Photo: D. Preston*

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