Northwest Indian Fisheries Commission

NEWS

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Being Frank

Let's Awaken The Sleeping Lady

By Billy Frank Jr.
NWIFC Chairman

It has been a little over a year since Governor Gary Locke met with the tribes at the Sleeping Lady Resort in Leavenworth, where three November days of detailed discussion culminated with the signing of the "New Millennium Agreement."

I remember thinking how appropriate it was for all of this to take place at this beautiful location, at the foot of the namesake mountain. Here, the "Sleeping Lady" has borne witness to all that has transpired between the Indian and non-Indian people for centuries. I imagined at the time that a Millennium Agreement might just awaken the lady, who could bear witness to long-awaited better times for our people. It seems the Sleeping Lady may have stirred and stretched for a moment, but then returned to her ageless slumber.

The Millennium Agreement was intended to be an agreement to "institutionalize" the state/tribal government-to-government relationship in preparation for the new millennium. To achieve this, the Governor and other state officials swore to make the principles of the 1989 Centennial Accord come alive in our day-to-day relations. Tribal officials concurred. The principles ranged from high level collaboration in economic, social/cultural and natural resources-related issues to improved communication, cooperative education, and the development of a consensus-based, lasting and respectful relationship between the state and the tribes. That may seem like a tall order. But these are the things that are needed if we're ever going to make real progress in state/tribal relations.

The words sounded great, but in the year since there has been very little follow up and virtually no progress in state/tribal collaboration.

In salmon management, for example, the Governor's "Extinction Is Not An Option" plan continues to be inadequate by any measure. There is no meaningful provision for state/tribal collaboration in this plan. The "voluntary compliance" it advocates may sound good to business and agricultural interests, but it fails to provide for any meaningful protection of salmon habitat or other treaty-protected natural resource management rights.

We hope the Governor's recent re-election will breathe new life into his commitment, and that he will work with us to develop a positive, collaborative relationship. We hope he will work with us to fully awaken the Sleeping Lady.

On The Cover: A spawned-out chum salmon on Kennedy Creek near Olympia will return nutrients to the watershed and help recharge the ecosystem. See related stories on pages 3 and 8. *Photo: A. Meyer*

Northwest Indian Fisheries Commission News

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Nov. 17 Proclaimed 'Salmon Day'

Governor Gary Locke joined Northwest Indian Fisheries Commission Chairman Billy Frank, Jr., in proclaiming November 17th "Salmon Day In The Pacific Northwest." The annual event was inaugurated with the dedication of the new Kennedy Creek Salmon Trail near Olympia.

Salmon Day is intended to be a day of statewide volunteerism, dedicated to encouraging people from all walks of life to take part in salmon restoration and related education, according to Chantal Stevens, Executive Director of People For Salmon. The statewide program, dedicated to community-based salmon habitat restoration, was the driving force behind having Salmon Day officially recognized.

"We're joining the Governor and the People For Salmon program in initiating the Salmon Day concept to encourage people to rededicate themselves to the respect, appreciation and understanding of this sacred resource," said Frank. "This is a special day to acknowledge that every individual and every organization has a stake in the vitality of the salmon, and must be personally accountable to it," he said.

"The salmon is an icon of the Pacific Northwest, where it has been part of the foundation of economic and cultural strength from time immemorial," said Governor Locke. "Its health and vitality is interwoven with the health and vitality of the people of the Pacific Northwest. The restoration and protection of salmon habitat will clearly contribute to the rejuvenation of salmon resources. Cooperation and proactive stewardship provide a significant pathway to the restoration of salmon habitat."

In pursuit of these objectives, people everywhere are asked to:

- Make a special effort to learn about and teach others about the significance of salmon;
- Become part of a salmon habitat restoration program;
- Establish a "company policy" supporting habitat restoration efforts;
- Adopt environmentally sensitive business practices;

A Washington Conservation Corps crew constructs a viewing platform along the Kennedy Creek Salmon Trail that was dedicated on the first annual Salmon Day in Washington. *Photo: A. Meyer*

- Bridge communication gaps and build alliances dedicated to salmon recovery, and;
- Pledge to make decisions that will benefit future generations.

"It is altogether fitting that this special day be inaugurated in concert with the dedication of the Kennedy Creek Salmon Trail. Here, people will experience a sight that has inspired tribal ancestors for thousands of years…a stream teeming with so many salmon that their true place in nature will finally be understood," said Frank.

The site includes trails, boardwalks and interpretive viewing sites on 5 acres owned by the Taylor Shellfish family. The $200,000 project was directed by the South Puget Sound Salmon Enhancement Group, with help and support from a variety of individuals and organizations, many of whom serve on the Kennedy Creek Management Committee.

The Taylor family has entered into a 20-year license agreement with the enhancement group to make the Salmon Trail available for 3-4 months of each year for people to witness salmon spawning in their natural environment. The trail is located between Olympia and Shelton just west of Highway 101 near Milepost 356.

Tribal Bat Study Eyes Critical Habitat

The Yuma bat, shown here, can be found from southwestern British Columbia to cental Mexico.

The Puyallup Tribe is examining possible environmental impacts of a massive housing development slated for the last significant oxbow on the lower Puyallup River. Effects on air and water quality, as well as fish and wildlife resources, from the addition of 925 homes on 164 acres along the oxbow or river's bend are among factors being studied by the tribe.

Identifying possible threatened or endangered species in the area is one part of the tribe's comprehensive review, and among the animals being investigated is one that most folks would just as soon avoid: Bats. Both Keen's bats and Townsend's big-eared bats – rarely found in western Washington – were recently listed as candidates for state and federal protection.

For the past two years, Puyallup tribal wildlife biologist Michael MacDonald has been working to determine critical habitat areas for bats in the lower Puyallup River area. About ten different species of bats may occur in the area. So far, he's found mostly big brown and little brown bats, two of the most common bat species in the United States. In the process, he's also become a night person.

Each day at dusk, bats in Washington leave their day roost to feed on insects. Most feed for several hours and then find a place to rest and digest their food. They repeat the process several times during the night before returning to their day roost. Females with young will normally return to their day roost after feeding so that they can nurse their pups while digesting their own dinner. Generally, females with young all roost together in a single maternity colony.

Finding those colonies helps identify critical habitat, determine the variety of species in the area, their overall populations and reproductive success, and other factors that help develop a comprehensive picture of critical habitat for bats in the area.

How do you follow a bat around? Well, first you have to capture one.

MacDonald, with the assistance of biologists from the Northwest Indian Fisheries Commission and Washington Department of Fish and Wildlife, uses long fine-mesh nets to capture the bats in flight. A small transmitter – about the size of a pencil eraser and the weight of a paper clip – is glued to the bat's fur. The transmitter falls off after a few weeks. After being released, the signal from the bat's transmitter can be followed to find its foraging and roosting sites. About a dozen bats have been fitted with transmitters as part of the project. So far, MacDonald has located one colony of about 70 bats; he suspects there are several others.

Puyallup tribal wildlife biologist Michael MacDonald, left, and NWIFC wildlife biologist Chris Madsen set up a net to capture bats on the lower Puyallup River. *Photos: Courtesy Puyallup Tribe*

MacDonald's overall goal is to find the bats' hibernacula – a place where entire colonies hibernate over the winter – usually situated in a different location than their summer roosting site.

"Bats get a bad rap, but they're actually very beneficial to people. For example, one bat can eat up to 600 mosquitoes in an hour," MacDonald said. That's no small feat when you realize that bats can weigh the same as three sheets of paper and don't see very well. They use high-frequency echolocation to find their prey. Interestingly, a bat in western Washington might use a different frequency than his cousin of the same species in eastern Washington or British Columbia.

"Bats are definitely getting more recognition now than they were a few years ago, but still very little is known about them," he said. "Insecticide contamination may be a reason why some bats are rarely seen in western Washington and why populations of other bats seem to be declining. Ironically, if bat populations are declining due to pesticide use, we could end up with even more pests like mosquitoes," MacDonald said.

Tampering with habitat, when you don't know the potential impacts, can have serious consequences. As the human population in western Washington increases, we may be substantially impacting a misunderstood but important animal species." – *A. Meyer*

Sauk-Suiattle Tribe Working To Save Mountain Goats

With mountain goat populations in the Darrington area dwindling, the Sauk-Suiattle Indian Tribe is working to save the threatened North Cascade Mountain Goat – a creature intimately linked with the culture of the tribe and the ecological stability of the region.

"Since time immemorial, the Sauk-Suiattle people have had strong connections with the mountain goat," said Sauk-Suiattle Tribal Chairman Jason Joseph. "Any threat to mountain goat survival is also a threat to the culture of the tribe."

Unfortunately, that threat is clear and present. Once, goat populations in the North Cascades reached as many as 1,400. Now, observers estimate the numbers have decreased to around 100 in the Darrington area – and even that number may be overestimated. With funding for recovery efforts hard to find, state and federal agencies have asked the Sauk-Suiattle Tribe to take the initiative in mountain goat conservation.

While a myriad of factors have caused the decline of goat herds, the tribe has identified a few measures which are critical to recovery: comprehensive studies; habitat preservation; and action against parasites and diseases plaguing the North Cascade Mountain Goat.

"We've seen how destruction of critical habitat can devastate herds, and we've seen how big a problem disease is," said Joseph. "Now, we need to address those issues — and do some studies which can identify other important issues."

Sauk-Suiattle has taken the lead in recovery efforts, but other tribes and tribal organizations have also proven to be staunch supporters. The Affiliated Tribes of Northwest Indians has passed a resolution firmly backing mountain goat conservation. The Upper Skagit Tribe is also pushing mountain goat recovery efforts, applying for a grant to help replenish the animals in the Jack Mountain area. Fortunately, a host of other organizations have also rallied to the animal's defense. The U.S. Forest Service, National Park Service, Washington Department of Fish and Wildlife, Safari Club International, Foundation for North American Wild Sheep, Hi-Line Helicopter Company and the University of Washington's Wildlife Science Program are among those working for a solution. Dr. William Foreyt of Washington State University's Department of Veterinary Microbiology and Pathology has volunteered his time and expertise.

With Foreyt's help, the tribe hopes to soon begin a disease-treatment program that will help goats afflicted with parasites survive the winter. Not only can parasites kill the animals, but they also make them more vulnerable to attack from a burgeoning cougar population.

The mountain goat plays a unique role in Sauk-Suiattle tribal culture. *Photo: D. Preston*

It is difficult to imagine a culture more connected to a creature than the Sauk-Suiattle culture is connected to the mountain goat.

When goats were shedding in early summer, tribal members would gather wool from upper mountain meadows to make clothing and blankets. Horn and bones from the animals were used to form tools. Goat meat was dried or otherwise preserved to provide a food source for the people during winter months.

Sauk-Suiattle social structures were symbolically fashioned after the matriarchal society of the mountain goat while the tribe and the goats together occupied the mountain terrain of the North Cascades. Archaeological evidence shows tribal reliance on the mountain goat dating back at least 8,000 years. This unique relationship continues to this day, exemplified by the goat's presence atop the Sauk-Suiattle tribal crest.

The survival of the mountain goat mirrors the tribe's own struggle to survive. Before 1855, the tribe had a population of 3,500. By 1920, the number had fallen to just 17. Today, the tribe's enrollment population stands at 200 members. To the Sauk-Suiattle, a unique mountain people, the survival of the mountain goat, a unique animal, is absolutely essential to the tribe's cultural heritage.

"The mountain goat is critical to the health of this area, environmentally and culturally," said Joseph. "We owe it to ourselves to make sure it recovers." – *J. Shaw*

Restoring The Salmon

After Nearly A Century, Salmon Return To The Upper Puyallup River Watershed

Standing on a bridge that spans Deer Creek in the upper Puyallup River watershed, Fred Dillon smiled as he looked down at the creek and the several hundred just-released adult coho.

"It's good to see these fish here," said the Puyallup tribal member. "They're some of the first salmon up here in about a hundred years." Dillon, a tribal fisheries technician, was part of a crew that had just trucked the ready-to-spawn coho into the watershed as part of the largest salmon enhancement project in the state.

The project is the result of a Resource Enhancement Agreement between the Puyallup Tribe and Puget Sound Energy, Inc. that has re-opened about 20 miles of mainstem Puyallup river habitat and 10 miles of tributary streams to chinook, coho and steelhead. The agreement averted a lawsuit by the tribe over impacts of a dam owned and operated by the utility company, which has blocked salmon access to prime habitat in the upper watershed for 97 years.

There are four main parts to the 30-year, multi-million dollar agreement, which aims to fully re-seed the upper watershed with salmon.

First, three ponds were constructed above the dam several years ago. Over that time, about 200,000 young coho and 100,000 young chinook salmon from local stocks were annually trucked up to the ponds, where they were acclimated and released to migrate downstream.

Secondly, a trap was installed to prevent the young salmon from being drawn into the dam's turbines and killed as they migrated downstream. The young salmon are regularly collected, trucked past the dam's powerhouse, and released back into the river.

Some of those salmon have now begun to return as adults, and were greeted by the third part of the agreement – a new $1 million fish ladder that was completed in October. An estimated 1,000 returning adult coho used the ladder during it's first few days of operation, said Russ Ladley, the tribe's resource protection manager.

The fourth – and most costly – part of the agreement requires the utility company to maintain instream flows for salmon in the watershed. From July through November, when salmon need extra water for passage, the utility has agreed to reduce the amount of water it uses to generate power at the dam.

The tribe has further supplemented salmon production in the upper watershed with surplus salmon from the Washington Department of Fish and Wildlife's Voight's Creek

Clockwise: Tribal biologist Melinda Davis seines coho from a holding pond at the state's Voight's Creek Hatchery near Orting. Davis and tribal biologist John Iverson sort males and females to be transported into the upper Puyallup River watershed. The Electron Dam, while only about 10 feet high, has cut off salmon migration into the upper watershed for about 100 years. A new $1 million fish ladder now allows salmon and steelhead to get around the dam. Above the dam, Puyallup tribal fisheries staff release hundreds of ready-to-spawn coho into Deer Creek, a tributary of the Puyallup River.

Photos: A. Meyer

Hatchery in nearby Orting. For the past four years, 1-3,000 adult coho – and some chinook – have been annually trucked above the dam and released to spawn.

"It is amazing how quickly these coho will find even the tiniest channels to spawn," Ladley said. Given a chance, they will fill and exploit available habitat quickly. They are incredibly adaptable."

While salmon are the direct beneficiaries of the project, many other species will benefit from the project indirectly.

Tributary streams below the dam already are fully seeded with natural populations of steelhead. With the new fish ladder in operation, it is believed that the ocean-going trout will move above the dam and fully use all of the new habitat now available to them.

Salmon returning to spawn above the dam are helping to create a healthier and more diverse ecosystem by loading the upper watershed with nutrients after they reproduce, die and decompose. Aquatic plants, insects, young salmon and trout, as well as larger animals such as bears and eagles all benefit from the food which the salmon provide.

"This has been a challenging process," Ladley said. "This has been a big, empty reach of stream that we are hopefully allowing to again function in a natural manner and provide benefits for everyone." – *A. Meyer*

Salmon Carcasses Return Nutrients To Watersheds

Fish are flying in watersheds throughout western Washington this time of year.

In the hopes of increasing the number of live salmon in watersheds throughout the region in the long term, treaty Indian tribes are introducing a substantial number of dead salmon to the river in the short term.

Efforts by the Quinault Indian Nation on the Washington Coast, and the Nooksack Tribe in the northern Puget Sound region are examples of how dead hatchery salmon are being used to boost nutrient levels in watersheds. The goals are healthier and more diverse ecosystems.

"Studies have shown that salmon carcasses benefit fish, wildlife and plant life," said Bob Kelly, natural resources director for the Nooksack Tribe. "Creatures from eagles to salmon will benefit from having these nutrients in the ecosystem."

A Quinault tribal fisheries technician prepares to throw a salmon carcass into a stream. *Photo: D. Preston*

Tribes Lead Habitat Restoration Effort On

After nearly a decade of effort, treaty Indian tribes on the Skagit River saw completion recently of a dike removal project which will open up hundreds of acres of habitat for thousands of chinook salmon.

The Skagit System Cooperative – the tribal natural resources consortium composed of the Swinomish Tribe, Upper Skagit Tribe and Sauk-Suiattle Tribe – was the initial source of the idea and the impetus behind restructuring the Deepwater Slough area. Over two miles of structures blocking historic wild chinook habitat were removed to better facilitate the juvenile salmon's journey to the sea.

"This project went forward, in large measure, because the tribes continued to pursue it over eight years," said Larry Wasserman, SSC environmental director. "We remained committed to ensuring that the project would reach completion."

To create increasingly rare estuarine (salt marsh) habitat for the fish, the tribes worked with Washington Department of Fish and Wildlife and the U.S. Army Corps of Engineers on what would become one of the largest dike removal programs in North America.

The $2.3 million task obliterated two main dikes on WDFW property, allowing the Skagit River and six tributary rivers to re-connect with their historic channels.

That's particularly important to ocean-going juvenile chinook salmon, who typically rest and feed in estuarine areas for two weeks to six months before migrating to the open water. Before, the fish could not use the slough to migrate through Skagit Bay to the ocean.

"Loss of these estuarine habitats is a key factor in the decline of chinook on the Skagit River," said Wasserman. "When fish have healthy estuaries to rest and feed in, they're healthier when they head out to sea – and that increases their rates of survival and return."

The recently recovered habitat will result in additional production of between 1,000 and 2,000 adult chinook, said John Klochack, a senior restoration ecologist with SSC. The 200-250 acres of estuary are desperately needed, and are in dwindling supply.

"Our work shows that these zones, which provide a transition between

When carcasses decompose, they become part of the river's web of life. Birds and mammals will eat much of the salmon meat; insects will get their share too, and will in turn be eaten by other species, including young fish. All told, energy derived from the carcasses will cycle through the system in many pivotal and unseen ways.

"One of the reasons salmon are so important to watersheds is nutrient transportation," said Paul Pittman, Nooksack Tribe watershed restoration coordinator. "Salmon transport significant amounts of nutrients from marine systems to freshwater systems. "By returning these carcasses to the river, we will increase biomass, which in turn improves fish production."

The Quinault Nation has been distributing the carcasses in streams in the Clearwater and Queets river basins on the Olympic Peninsula for the past three years. The dead fish – mostly coho – come from the Quinault Indian Nation's Salmon River hatchery. The fish are hand spawned for rearing, then the carcasses are returned to the stream and also distributed to community members.

For the Nooksack Tribe, the first-year project is being conducted on a trial basis at five sites in the region. Fish for the project were donated from the Washington Department of Fish and Wildlife's Kendall Creek Hatchery. The project is partially funded by the U.S. Fish and Wildlife Service.

When the preparations are complete in January, Nooksack Natural Resources staff will begin floating the carcasses downriver from five different bridges in the region. The carcasses will be frozen before being distributed to provide greater durability upon release and make it more likely that they will reach the target area before decomposing and dispensing their nutrients.

The Nooksack Tribe hopes that a successful effort this year will lead to bigger things in the future – plans are in the works to include salmon from the Lummi Nation's Skookum Creek Hatchery in next year's nutrient distribution.

"There is already research out there that says you get more salmon smolts or bigger salmon smolts as a result of putting these carcasses out there, and we should be able to see if that is happening in the spring when those smolts begin to migrate downriver," said Quinault tribal biologist John Cornell.

The tribe has been adding carcasses to Christmas and Hurst creeks and will compare the size and numbers of smolts to creeks that did not receive carcasses.

"There are a lot of variables, of course, when you talk about what factors improve smolt numbers or size, but we're hoping to see a clear difference in those two streams this spring," Cornell said.

– D. Preston & J. Shaw

The Skagit River

freshwater and saltwater for salmon, are in short supply," he said. "This is the scale of project necessary to recover chinook in this area."

The process of building dikes began on the Skagit River in the late 1880s, though the two miles that were removed probably date from the 1940s. SSC managed and led the initial feasibility study which pointed toward dike removal as an option to restore estuarine habitat.

In addition to creating fish passage where once there was none, the dike removal project promises to allow historic Skagit River channels to re-form. This, in turn, will create even more desirable habitat for the chinook.

"As soon as we get flood water, the energy of the flood water will carve channels," explained Wasserman.

The Deepwater Slough dike removal effort is larger than most other projects of this nature, but similar efforts have been successful elsewhere in the Pacific Northwest. Salmon recovery strategies of this type were employed on the Chehalis River, the Nisqually River and on the Oregon Coast.

John Klochak and Larry Wasserman of Skagit System Cooperative survey habitat improvements at Deepwater Slough on the Skagit River. *Photo: J. Shaw*

The U.S. Army Corps of Engineers provided 75 percent of the project's funding, with WDFW providing the remaining 25 percent. SSC is in charge of monitoring the new habitat.

– J. Shaw

Fish Provide Earful Of Information

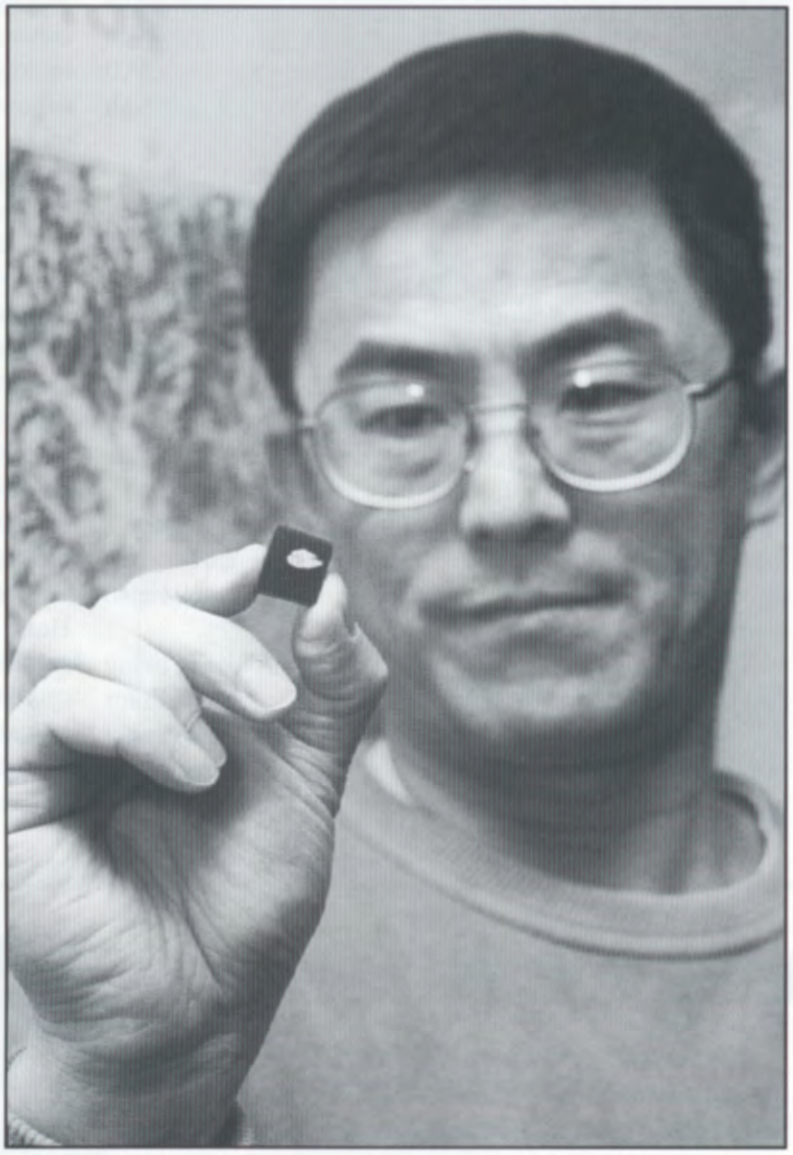
Using a technique known to only a handful of scientists on the West Coast, a Makah tribal research scientist is able to tell where a fish comes from by analyzing its ear bones. The advanced research technique is providing much-needed information about halibut, salmon, black cod and other fish stocks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



Makah tribal fisheries research scientist Youngwen Gao displays a fish otolith, or ear bone. Gao can determine where a fish comes from, as well as other information, from analyzing the bones.

Photo: D. Preston

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 halibut being added to 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 bones 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 is comprised of 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. "We are optimistic that Youngwen will bring understanding through his studies. We look forward to what can be accomplished in marine fisheries and marine sciences as a result of his work," Svec said. – *D. Preston*

Youngsters Learn At Tribal Hatchery

Sixth-graders from Presidents Elementary School watch Kip Killebrew harvest eggs from a female chum salmon.

Photo: J. Shaw

Salmon have been part of the Pacific Northwest for millions of years – but the future of these magnificent fish is in doubt. If they are to survive for many more years, the responsibility likely falls to future generations.

That's one reason the Stillaguamish Indian Tribal Hatchery offers tours of its grounds to Arlington area schoolchildren. The morning of Dec. 11 found Presidents Elementary School science teacher Jeanette Opiela leading her class through the hatchery.

"It's a great opportunity for them," Opiela said. "For them to actually see salmon enhancement happening in their community, I think, is really learning."

Students get hands-on experience with salmon anatomy, for example, by observing dissected male and female fish. But it doesn't stop there: each group is shown the basics of feeding hatchery salmon; incubating the salmon eggs; protecting and enhancing habitat for all fish in the watershed; and preserving the level of water quality healthy ecosystems require.

"We're trying to show them some of the things we do at the hatchery, but it goes beyond that," said Stillaguamish Tribe enhancement biologist Kip Killebrew. "We're trying to acquaint these young people with the idea that salmon are worth saving, and that it takes a team effort with many different aspects to accomplish that." – *J. Shaw*

'River Of Life'

Elaina Brassard, center, Ashley Bazzar, right, and Austin Bethel are shown with a recently unveiled permanent public art display at the entrance to Mountain Meadow Elementary School in Buckley.

The concrete "River of Life" shows the life cycle of salmon. It is joined by 100 ceramic fish swimming the walls outside the school and a 50-foot-long mosaic mounted inside the school. The works of art were done by students and staff. The project gave students the chance to meld science, art, math and cultural classes.

For three years, third and fourth grade students at the school have also worked on a project called Stream Team. They've learned about the life cycle of salmon and have helped restore salmon habitat on Newaukum Creek, a tributary of the Green River.

The Muckleshoot Tribe gave students insight into the Native American culture involving the salmon, said principal Janel Keating. Brassard and other tribal dancers helped celebrate the unveiling of the art project during a dinner at the school, which featured salmon provided by the tribe.

Photo: A. Meyer

Quileute Tribe Teams Up On Elk Project

Knowledge about the elk herds in the Dickey River drainage will improve with the tracking of 19 radio-collared elk in the area northwest of Forks.

The project is a cooperative effort between the Quileute Tribe, Washington Department of Fish and Wildlife (WDFW) and Rayonier timber company.

"Up until now, we were using aerial surveys to count the elk," said Adam Kowalski, Timber, Fish and Wildlife biologist for the Quileute Tribe "They are OK, but collaring is certainly a much better way to get information about where the herd moves, calf numbers, mortality and survival and what they are eating," he said.

Rayonier provided the helicopter time required to dart and collar the elk in the latter part of November, WDFW donated their staff time to assist with the collaring. The agency is conducting a study on body fat as an indicator of health over the three years of the radio collar study.

Use of the radio collars allows tribal biologists to locate a herd easily. Helicopter surveys are expensive and many elk go uncounted because they can't be seen under trees. The collars give much more information to biologists at a lower cost than expensive aerial surveys.

Over the next three years, the elk will be recaptured in the spring and fall to check their health. The tribe will get a good idea of the difference between how many fawns are born and how many survive their first year.

"This will give us a much more accurate picture of the population numbers of these herds. That's very important for game management plans," said Kowalski.

The total cost to set the project up was less than $15,000 thanks to the donated air and WDFW employee time.

"We couldn't do these projects without the cooperating partners," Kowalski said.

"The Quileute Tribe has been very interested in getting more technically involved in the management of elk and other wildlife species and this provides an excellent start," said Mel Moon, Quileute tribal natural resources director. "It also builds genuine area relationships and support for a common natural resource cause." – *D. Preston*

Brent Ramsey, right, Quileute Natural Resources technician, checks the status of an elk collared as part of a joint project. *Photo: K. Boysen, Quileute Tribe*

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