

Northwest Indian Fisheries Commission

NWIFC News



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INSIDE:

- Depending on Razor Clams
- Fighting Fish Disease
- Sustaining Elk Populations
- Grandmothers Focus on Treaty Rights
- Fish Carcasses Provide Clues
- Cows Work for Salmon

It's Been A Long 25 Years

By Billy Frank Jr.
NWIFC Chairman

We're marking an important milestone in salmon co-management this year. It's the 25th anniversary of the North of Falcon (NOF) process, which sets treaty tribal and non-Indian fishing seasons in western Washington. We've sure come a long way in that time.

The 1974 Boldt decision made it clear: Treaty Indian tribes in western Washington had reserved rights to half of the harvestable salmon returning to state waters and were equal partners with the state of Washington in managing the resource.

Slade Gorton, who was Washington's attorney general at that time, told Gov. Dan Evans that the state didn't have to implement the ruling. The case would be won on appeal, he said, but he was wrong.

For the next few years, the state refused to implement the ruling and there was chaos on the water. People took the law into their own hands. It got so bad that Judge Boldt suspended the state's authority to manage salmon for several months and put the National Marine Fisheries Service in charge.

Those were dark days, but through them we were able to discover a path toward cooperation instead of litigation. That path led to the North of Falcon process, named for the management area for Washington salmon stocks – which goes from Cape Falcon, Ore. to the Canadian border.

While the process for setting salmon seasons through NOF is highly complex, the rules for getting there are simple: Be polite and try to meet each other's needs while protecting weak and ESA-listed salmon stocks and ensuring that enough adult salmon escape harvest to sustain the next generation. We develop fisheries based on their impacts to salmon stocks on a river-by-river basis.

Work on this year's effort began



months ago with development of conservation goals, pre-season forecasts and estimates of impacts to specific salmon stocks at various levels of fishing effort.

We'll see more chinook in Puget Sound this year because of the new Pacific Salmon Treaty agreement that reduces harvest

of the fish by Alaskan and Canadian fishermen. This is a pink salmon year, too, so there will be more fishing opportunity on these fish as well.

Like all fisheries, though, these will come with some costs. We will have to pass most of the chinook savings on to the spawning grounds. And while pink salmon will be plentiful this year, we have to carefully watch these fisheries for incidental impacts to coho and ESA-listed Puget Sound chinook.

"It seems like it would get easier after 25 years, but it gets harder," Swinomish tribal fisheries manager Lorraine Loomis told me recently. She is vice-chair of the NWIFC and the coordinator of tribal participation in NOF, one of the toughest jobs in Indian Country.

One of the reasons it's getting harder is that as the resource shrinks, so does the room for error in salmon management. While we do a good job managing our harvest and our hatcheries, we can't control the main reasons for salmon declines, which are loss and destruction of their habitat.

Only through cooperation – the kind of cooperation that helped create and sustain the NOF process – will we be able to do that.

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On the cover: Charles Anderson, Quinault Indian Nation member, scans the surfline for razor clams on Roosevelt Beach, south of Taholah, during a commercial razor clam dig in March.

Photo: D. Preston

The Culture and Economics of Razor Clams

A fierce, cold wind flags the hood of Charles Anderson's windbreaker as he scans the sand just shy of the Pacific surf for the telltale bump of a razor clam. For the Quinault Indian Nation (QIN) tribal member, harvesting razor clams on the ocean beaches near Taholah is something he has done since he was a child.

"It helps us pay our bills," Anderson said during a commercial razor clam dig on Roosevelt Beach. "Many people are unemployed. It's survival for us. We fish, dig clams and hunt. We have six kids, so every little bit helps."

Anderson's family is with him on this cold sunny day. Groups of families that have harvested together for generations continue that tradition by lending a hand, a replacement shovel or sharing a snack.

Anderson's tools are a specially designed steel shovel and a lightweight net that hangs off his waist. Historically, tribal members used a stick from

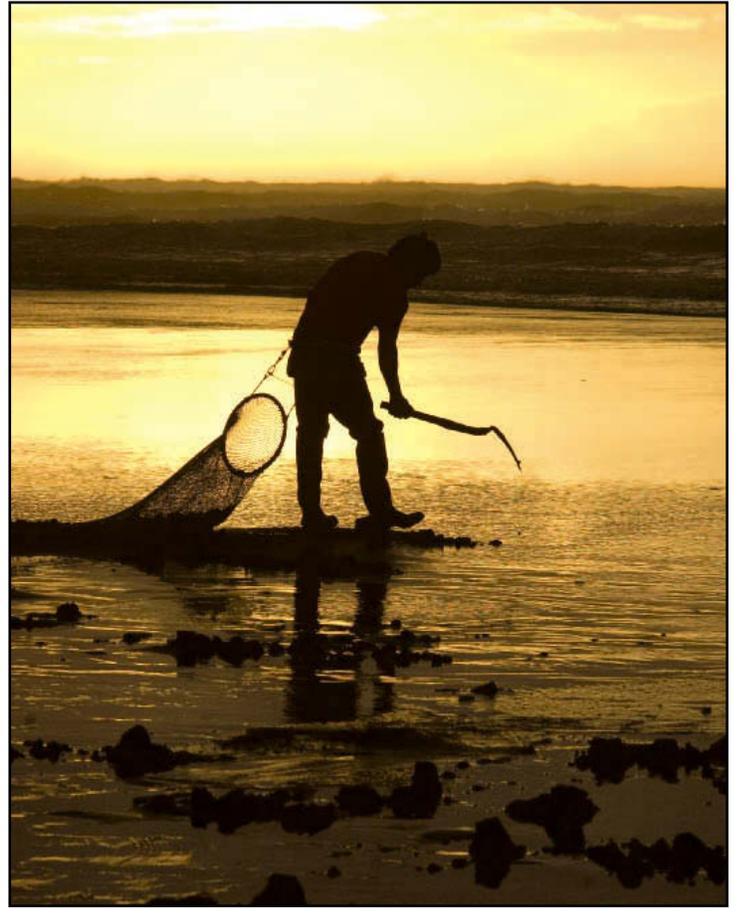
the sturdy yew tree to tease out the clam before it could retreat into the sandy depths faster than a person could dig. A woven cedar bark basket held the day's harvest.

The QIN's Quinault Pride Seafood company is the only business on the Washington coast that commercially cans razor clams. This year, tribal members are earning about \$1.50 a pound for razor clams sold to the company.

"We ship razor clams all over the United States, but most of the demand for the canned clams is regional," said Robert Vessey, fish buyer for Quinault Pride Seafood. The company also sells vacuum-packed whole clams and bags of diced clams for chowder.

David James Jr. has been digging razor clams for as long as he can remember.

"When I wanted school clothes or spending money, my family handed me a razor clam shovel and a bucket," James said. "These days, it helps pay the power and phone bill



Quinault Indian Nation member Donald Hawks participates in a commercial razor clam harvest on a beach near Ocean Shores this winter.

Photo: D. Preston

and keeps food in the freezer."

When he's digging razor clams to eat, James likes the smaller ones.

"They aren't as chewy. When you are digging commercially, though, you go after what they call the 'mossbacks,' the big ones," he said.

"We know of some families that are eating razor clams nearly every day

from their freezer," said Joe Schumacker, QIN's marine resources scientist. "It's how they survive."

The QIN and state work together to assess the clam populations on off-reservation beaches and develop harvest limits based on the available percentage of clams. The harvest is shared equally between recreational and tribal diggers. — D. Preston



Quinault Indian Nation member Daniel Woods pursues razor clams after dark using a lantern designed for night clam digging. *Photo: D. Preston*

Skokomish Tribe: Agreement Will Help Restore Watershed

The Skokomish Tribe is wholly devoted and committed to restoring the Skokomish watershed and its resources – not just for the next five years, not just for another 40 years, but forever.

Part of this commitment has involved recent work with the city of Tacoma on the impacts of the city’s Cushman Hydroelectric Project on the Skokomish watershed. In January, we signed a historic agreement with the city that addresses how to bring the ecosystem back to life.

The Cushman Hydroelectric Project is actually two dams and an out-of-basin diversion to a power-generating plant on the shores of Hood Canal.

Cushman Dam No. 1 was built in 1926, creating Lake Cushman. It was built without fish passage facilities and completely blocked access to the upper North Fork of the Skokomish River. Cushman Dam No. 2 was built downstream from Lake Cushman and completed in 1930, forming Lake Kokanee. It was also constructed without fish passage facilities but did incorporate a diversion of all North Fork Skokomish River flows out of the basin to the power plant on the shores of Hood Canal, dewatering the lower North Fork.

Together, the two dams reduced the river’s water flow to a trickle, fundamentally altering the biology and geol-



Joseph Pavel

ogy of the river system, and deeply affecting Skokomish tribal culture and our treaty-reserved fishing rights.

This milestone has been long in the making and the tribe has persevered during this long process. This has also been a personal journey – my great grandfather, George Adams, protested the dams’ construction and my mother, Anne Pavel, was the tribal chair when the dam’s original operating license expired in 1974. The tribe intervened when Tacoma submitted an application for re-licensing. The application gathered dust at the Federal Energy Regulatory Commission (FERC) for 11 years. I first became involved when FERC replied with a request for additional information.

We’ve also called upon our people over the years, asking them, “What does it mean to you? How will it affect you and how can we mitigate for the harm that has been done?” The late elder Joe Andrews said it best: “They need to put the river back where it belongs!”

The agreement signed in January resolves a \$5.8 billion damages claim by the tribe and long-standing disputes over terms of the federal license for the project. River restoration, instream flows, fish habitat and fish passage improvements, wildlife habitat and restoration of fish populations are among the issues addressed by the agreement. It also allows the city to operate the dams for another 40 years.

The impact to the tribe can never be undone, but this agreement represents an opportunity to begin the healing process to the environment the tribe depends upon for its survival. The health and well-being of the Skokomish watershed is vital to the Skokomish tribal culture, tradition, subsistence and economy. We look forward to our future relationship with the city of Tacoma to ensure the resources we depend upon are available for generations to come.

Joseph Pavel is the Skokomish tribal chairman and director of the tribe’s natural resources department.



Generations

Skokomish elder Emily Miller sorts through sweet grass and bear grass, in preparation for making a basket in the late 1960s. The weavers sorted the grasses by size so they would know which bundles were similar in length and thickness. They also used cattails in their weaving.

Photo: Skokomish Tribe

Preventing Pollution in Little Skookum



Levi Keesecker, a Squaxin Island Tribe biologist, takes a water sample at the mouth of Deer Creek as it flows into Little Skookum Inlet. Deer Creek is a major suspect in rising pollution levels in Little Skookum.

Photo: E. O'Connell

The Squaxin Island Tribe is working with local shellfish companies to ensure Little Skookum Inlet doesn't become too polluted for shellfish harvest. The tribe and the companies began an intensive monitoring effort last fall to protect the bay after ongoing monitoring detected slowly increasing bacteria levels, especially during extreme rain storms.

"It is still very safe to eat shellfish from Little Skookum, but we want to solve any water pollution problems before they get any worse," said John Konovsky, the tribe's environmental program manager.

Little Skookum produces more than 12 percent of Washington's shellfish. The most likely sources of the increased water pollution are failing septic systems and poor livestock management practices.

High concentrations of bacteria are routinely found in Lynch Creek just below Fawn Lake, and during the recent heavy rains, coming out of Skookum Creek.

"The first step in stopping pollution is increased monitoring," Konovsky said. "Now that we have some clues to the sources, we can focus our investigations."

Employees from seven shellfish companies regularly monitor water quality in several streams that feed Little Skookum. They also track rainfall in the watershed. The state Department of Health monitors saltwater quality in the bay. The tribe is coordinating the overall efforts, and is working with Mason County and Mason Conservation District to find workable solutions.

The tribe wants to prevent the kind of slow decline of Skookum Inlet that is al-

ready being seen in other southern Puget Sound inlets, Konovsky said.

Just north of Little Skookum Inlet lies Oakland Bay, another productive shellfish area, which has seen an increase in water pollution, threatening several shellfish harvesting beds.

"We had to scramble to ramp up monitoring and research to prevent a massive harvest closure in Oakland Bay. We're getting a head start in Little Skookum," Konovsky said.

"Little Skookum is a very special place for the Squaxin Island Tribe. It is the backyard for many of our tribal members," said Andy Whitener, natural resources director for the tribe. "If we fail to prevent pollution from closing Little Skookum, it would be a huge blow to us and our neighbors." – E. O'Connell

Education is Key to Protecting Oakland Bay

People living along Oakland Bay don't think they have anything to do with the significant increase in pollution in the bay, according to a survey by the Sa-Heh-Wa-Mish Stewardship Initiative and the Squaxin Island Tribe.

"We have direct evidence that the human population around the bay contributes to water pollution, but it's hard for people to connect their individual actions with the problem," said John Konovsky, environmental program manager for the tribe. Recent studies have identified human and livestock fecal coliform as a source of pollution threatening Oakland Bay.

"We can't clean up Oakland Bay without the help of all the landowners in the watershed," said Andy Whitener, natural resources director for the tribe. "The first step is to be able to draw the link between where the pollution is coming from and the impact it's having on human health and people's jobs."

Oakland Bay is the largest producer of manila clams in the country and

private shellfish farmers are among the largest employers in Mason County.

Other results of the survey include:

- More than half of the owners of septic systems that had not been inspected in the last five years said their septic was a not problem.

- More than 60 percent of livestock owners said they didn't have enough livestock to pose a problem.

These conclusions were gleaned from interviews late last year with more than 150 Oakland Bay residents.

"Right now, there is an unfortunate disconnect between what we know about the pollution and the best way to clean it up," Konovsky said. "We need to somehow make the connection real to ensure that we all know how to do our part."

In Oakland Bay, it only takes the failure of four septic systems in one year to increase bacteria to levels that would

'We can't clean up Oakland Bay without the help of all the landowners in the watershed.'

ANDY WHITENER,
director of natural resources,
Squaxin Island Tribe

shut down shellfish harvest.

Both Mason County and the Mason Conservation District are poised to help landowners with money for septic tank riser installation and assistance with livestock management. The funds are intended to ease the financial burdens of improving stewardship.

In addition to the massive impact a shellfish harvest closure would have on the local economy, decreased water quality in Oakland Bay is a huge threat to human health and local property values. "Living next to a poisoned body of water is not a great selling point," Konovsky said. – E. O'Connell

Leading the Fight on Fish Disease

Pathologists and biologists tackle lethal IHN fish virus

Like humans, fish can carry pathogens that don't kill them. Different strains of the same pathogen, however, can be lethal. That's the problem confronting the Quinault Indian Nation (QIN) with their steelhead enhancement efforts in the Quinault River watershed.

Quinault River steelhead have been infected with a strain of Infectious Hematopoietic Necrosis (IHN), a virus that has killed hundreds of thousands of steelhead in the Columbia River watershed since it was first detected in hatchery trout in Idaho in the 1970s and spread to the lower Columbia River by the 1990s. It attacks the blood-forming tissues such as the kidney and spleen, causing death by anemia.

"There are several strains of this virus," said Bruce Stewart, fish health program manager for the Northwest Indian Fisheries Commission (NWIFC). "Here in western Washington, we typically see the strain that is endemic in sockeye salmon. Although this strain is lethal to young sockeye salmon, it does not appear to be as lethal to steelhead stocks."

The strain found in QIN steelhead, however, is highly lethal to steelhead. It was detected for the first time in western Washington in 1997 in steelhead and the QIN's Salmon River Hatchery. It did not reappear until 2007 when it was de-

tected in the Humptulips, Chehalis, Queets and the Quinault systems.

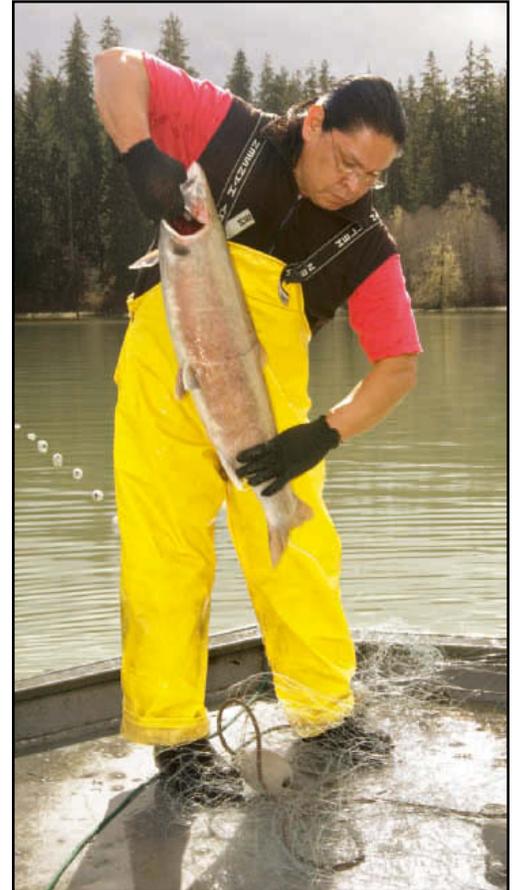
The QIN has decided to destroy fish each time the disease has appeared. "We need answers about how the fish are acquiring this disease so we can adjust our management plans accordingly," said Tyler Jurasin, QIN operations section manager.

QIN successfully applied for \$50,000 from the Bureau of Indian Affairs and joined with U.S. Fish and Wildlife Service (USFWS) to fund research that will answer the key questions regarding this strain of IHN. Two U.S. Geological Survey (USGS) researchers will work closely with QIN and USFWS to study the genetic strain of IHN found on the coast and attempt to quantify how much virus is shed from infected hatchery fish. They also will try to determine how long the IHN virus stays alive in the waters of Lake Quinault after it is shed from a fish.

Samples of lake water will be seeded with live virus to see how long it survives at varying temperatures.

"Gael Kurath, the lead USGS researcher on the project, is one of the top scientists in the nation who has done work on this strain of IHN," Stewart said.

Kurath traced the origin of this strain of IHN lethal to steelhead to its source in the Hagerman Valley in Idaho where it first appeared more than 35 years ago. This strain has occasionally flared up downstream



Steven Quilt, QIN fish culturist and tribal member, prepares to spawn a Quinault River steelhead at the QIN's Lake Quinault Hatchery. Photo: D. Preston

of the Hagerman Valley and in the Lower Columbia in some years.

"Although we don't know how the virus is being brought into our coastal systems in Washington, we suspect there is some link to infected fish that are leaving the Columbia River," Stewart said. "The tribes are taking the lead to try to get answers about this disease."

All four Washington coastal treaty tribes have prioritized seeking Hatchery Reform funding for a second year of IHN research.

– D. Preston



As part of the research into the pathogen invading Lake Quinault steelhead, researchers are looking at hatchery steelhead reared in the net pens on Lake Quinault to determine how long the pathogen remains viable in various temperatures of lake water. Photo: D. Preston

Nooksack Tribe Revisits Traditional Dip Net

It had been 25 years since the Nooksack Tribe's cultural resources director, George Swanaset Jr., made a traditional dip net.

He and his grandfather used to fish with a dip net in the Nooksack River, but the method has fallen out of practice in favor of larger set nets. Swanaset recently made a long-handled net with a cedar handle, vine maple hoop and bone rings, to demonstrate dip-netting to young adults in the tribe's YouthBuild program.

"Basically what it is, is a net on a stick," he said. "You drift your net down into a pool until you feel something bump. You won't catch it the first time. You just feel a bump and know it's there. It's really a long, slow process, but once you start feeling them in there, then you start catching them one by one."

One of the advantages of a dip net is that it catches fish by surprise, he said.

"I seem to have caught more fish in a dip net than I did an eddy net when I was fishing the river," Swanaset said. "In an eddy net, they hang there and splash around and all the other



Jeremiah Johnny (left), a Nooksack fisherman and the tribe's cultural habitat technician, and George Swanaset Jr., Nooksack tribal member and cultural resources director (center), watch tribal member Jessica Williams use a dip net in the Nooksack River. Photo: K. Neumeyer

fish get warned. You got your dip net, you're pulling them in one at a time, there's nothing there for them to be scared of."

Dip nets also allow fishermen to safely release native fish that they do not wish to take from the river.

The YouthBuild students had been studying the 1974 *U.S. v. Washington* federal court ruling, the Boldt decision, which reaffirmed tribes' right to fish

in their usual and accustomed areas. They're learning "the struggles and the battles that fishing Indians have been going through and still go through today," said tribal council member and YouthBuild program manager Katherine Canete.

The YouthBuild program is open to tribal members aged 16 to 24. Students earn their GED or high school diploma and learn leadership skills.

"Part of their leadership development is learning more about their culture," Canete said. "How they were federally recognized, just what their ancestors went through and what we have to preserve today as the new generation. And also, I was never taught these things when I was young, so it's also giving me the opportunity to learn more." – K. Neumeyer

Little Geoduck



Right: Lummi Shellfish geoduck specialist Flavian Point (right) and shellfish specialist Leah Paisano plant geoduck seeds in sand trays, where they will grow for up to three months. Above: Geoduck larvae are magnified on a computer screen. The Lummi Nation is one of a few shellfish growers with the capacity to raise geoduck larvae to the seed stage for commercial sale. Photos: K. Neumeyer



Tribal Efforts Help Elk Herds

Puyallup Tracking Method Shows Smaller Elk Herds

The South Rainier elk herd is smaller than previously thought, according to a new population model developed by the Puyallup Tribe of Indians.

“Our results point to a herd size of about 900. That’s about 1,100 fewer animals than a previous estimate by the state Department of Fish and Wildlife,” said Barbara Moeller, wildlife management biologist with the Puyallup Tribe. The tribe’s target population for the herd is 2,100.

The model, which is the first of its kind in western Washington, allows the tribe to more easily estimate the size of the herd using aerial surveys. Called a “sightability model,” the program helps determine population size by gauging the relationship between the number of elk that can be seen from the air and those that can’t be seen because of the amount and type of vegetation in the area. Following the success of the model work completed by the tribe, state wildlife managers have followed suit and are trying to develop similar models for estimating elk populations for both the Nooksack and the Mount St. Helens herds.

“Previously, state wildlife managers have made elk population estimates with a technique that uses harvest data,” Moeller said. “Using a sightability model approach, we can be more accurate and efficient.”

The older method used by the state doesn’t take into consideration the mortalities that occur in the population from causes other than reported harvest. Mortalities caused by wounding during hunting, auto collisions, poaching, predation, natural causes and disease, for example, aren’t taken into consideration.



Some members of the South Rainier elk herd cross the Cowlitz River near Packwood. The herd size is smaller than previously thought, according to new research by the Puyallup Tribe of Indians. Photo: B. Moeller

Years of research and radio collaring by the tribe were used to build the model.

“The population modeling work we have completed complements the ongoing management activities and herd research project we are working to complete,” Moeller said.

Several factors, including development that has encroached on the herd’s historic winter range area, are limiting the herd’s size.

“These elk depend on there being food on the valley floors in the winter, below where snow typically is,” Moeller said. “But those traditional feeding areas are being taken up by development. Too much of the elk’s

traditional range has been threatened by further development and county officials.”

To help reverse this trend, the tribe stored more than 300 acres of land. The tribe also is working to purchase and buying 45 acres of bottomland that is used by elk.

“Having a better handle on the herd equals better management,” Moeller said. “We monitor the herd closely and accurately we have a better chance we have of maintaining the population of elk for many years.”

Folders Contribute to Increased Elk Tag Returns for Muckleshoot

The Muckleshoot Indian Tribe distributed free hunting paperwork binders to their hunters last fall and as a result, there was a boost in the percentage of returned tags after the season closed December 31.

“Harvest reporting has increased substantially this year,” said Dave Vales, wildlife biologist for the Muckleshoot Tribe. “Even as the number of hunters we license increases every year, we saw a sharp uptick in the percentage of tags we had returned this last season.”

The tribe typically has had more than 90 percent returns but that declined to 87 percent in 2006 and 2007. In 2008, returns increased to 95 percent.

“It’s amazing that such a simple device, just a binder to keep all of their records together, is having such an impact on our ability to collect data,” Vales said.

Each binder costs the tribe \$40 and is provided free to every hunter. The blaze-orange organizers include a field observation form, blank Rite-In-The-Rain reporting pages, zip ties to secure tags, up-to-date ordinance and regulations, and a clear vinyl pouch to hold tags and a pen.

The post-season tag data is one of the most basic elements of tribal wildlife management.

“Even though our harvest numbers are dwarfed by the number of animals taken by non-tribal hunters, accurate harvest reporting is an essential aspect of our management,” said Dennis Anderson, chair of the tribe’s wildlife committee. “We use this in conjunction with the other data we collect, such as information from our radio-collared elk and deer studies and on habitat conditions to set season regulations.” — E. O’Connell

The Muckleshoot Tribe is passing out binders to help hunters organize their paperwork. Photo: T. Meyer

Thrive



guggling herd is much smaller than
er, Puyallup Tribe

fragmented and continues to
development allowed by state

and, two years ago the tribe re-
ses of winter elk habitat. The
protect existing elk habitat by
m land that is already being

on how many elk are out there
t,” Moeller said. “The more
can track their numbers, the
managing a sustainable popu-
rs to come.” – E. O’Connell



Lower Elwha staff Kim Sager-Fradkin (left), Brandon Nickerson (center) and Phillip Blackcrow monitor an elk’s temperature and collect hair and blood samples during a radio-collar capture. Photo: Lower Elwha Klallam Tribe

Lower Elwha Klallam Starts Roosevelt Elk Study

With an interest in the long-term sustainability of elk populations on the north Olympic Peninsula, the Lower Elwha Klallam Tribe has started a three-year research project to gather information about the elk herds between the Elwha River and Clallam Bay.

The tribe has two key goals: to gather basic information on the Roosevelt elk that live in the Elwha River region prior to deconstruction of the Elwha dams in 2012; and develop methods for longer-term monitoring of these herds. This will allow the tribe to determine if the elk population is increasing, decreasing or remaining stable.

The study will provide the tribe with information about seasonal elk movement patterns, habitat requirements, and population size and structure.

The tribe is focusing on the Pysht Game Management Unit (GMU), which runs north of Highway 101, from the Elwha River west to Clallam Bay. Little is known about the herds in this area, which includes the Elwha and Indian valleys and the Joyce-Piedmont area.

Frequent inhabitants of region’s valleys, elk rely on the Elwha River floodplain for food, overwintering and calving. Deconstructing the 108-foot Elwha Dam and the 210-foot Glines Canyon Dam will help restore more than 500 acres, including floodplain habitat, which have been inundated by water for nearly 90 years.

“The tribe has little information about these herds, such as whether the populations are increasing or decreasing,” said Lower Elwha Klallam Tribe wildlife biologist Kim Sager-Fradkin. “The tribe is interested in how elk use floodplain habitats along the Elwha before the dams are removed. We are also interested in developing methods for long-term population monitoring throughout the entire Pysht GMU.”

For the next three years, the tribe will be collecting fecal pellets for DNA analysis, conducting helicopter surveys, and capturing and equipping several elk with Global Positioning System (GPS) radio-tracking collars. Since January, the tribe has been fitting elk with radio collars, which will help the tribe track movement patterns.

‘The tribe is interested in how elk use floodplain habitats along the Elwha before the dams are removed.’

KIM SAGER-FRADKIN,
wildlife biologist,
Lower Elwha Klallam Tribe

The tribe always has used elk for subsistence, cultural and spiritual purposes, and strives to preserve its treaty-reserved right to hunt. This elk management program is aimed at collecting data that will allow the tribe and Washington Department of Fish and Wildlife to set more biologically based harvest regulations, thus ensuring the long-term sustainability of these herds, Sager-Fradkin said.

Funding for the study comes from the Department of Health and Human Services-Administration for Native Americans and the U.S. Fish and Wildlife Service. – T. Royal

CSI: Suquamish Tribe

Fisheries biologist gathers evidence from fish carcasses



Left: Jon Oleyar, fisheries biologist for the Suquamish Tribe, retrieves a coho salmon carcass during a stream survey on Dickerson Creek. Above: Oleyar pokes around the stream looking for carcasses. Photos: T. Royal

Jon Oleyar likens stream surveying to the television show *CSI: Crime Scene Investigation*. But rather than seeking evidence to solve a crime, the Suquamish Tribe fisheries biologist hikes Kitsap County's streams for evidence of spawned-out salmon carcasses – particularly coho.

Late fall is a busy time of the year for tribal staff throughout western Washington as they hit the streams to try to gauge the number of adult salmon that returned to spawn.

"I feel like I'm part of a CSI team – Coho Stream Investigator," he said. "Just finding them is the hard part. You have to think like a fish or a predator – 'Where would I go to spawn?' or 'Where would I go to eat this fish?'"

He finds carcasses in various states, from fully intact to partially eaten. Based on his obser-

ventions, he can figure out what happened to the latter.

"This is a perfect specimen," he said of a discovered intact fish. "It's still relatively fresh and a critter – probably a river otter – recently attacked and killed this female. By noting the absence of eggs and a worn tail fin, from digging a salmon egg nest in the gravel, I would say she most likely spawned prior to being killed."

It's the ideal scenario – the fish gets to spawn, the predator gets what it needs and Oleyar is still able to collect his sample.

He measures its length, makes note of the gender and checks the snout for a coded-wire tag. The millimeter-long tag contains information about which hatchery it came from and when it was released. He also notes if the fish's adipose fin is missing or intact. If it's missing, it's a hatchery fish; if it's intact, it's most likely a wild fish.

Carcasses play an important role in the wild and in science. The decaying fish are a source of food for animals and provide nutrients for streamside vegetation that helps improve water quality. For biologists, counting dead fish gives them a good idea of how many are coming back to their natal streams.

"All this information has been very powerful in helping

Visit www.nwifc.org/section/podcasts to hear an audio version of this story.

the tribe monitor the various salmon population trends over the last decade, understand their needs and observe how they react to changes to their environment," Oleyar said.

Since 1998, between the months of October and December, Oleyar has made weekly hikes up and down Kitsap's numerous salmon-producing creeks, including Dickerson Creek. The stream is a tributary to Chico Creek, one of the most productive salmon streams in Kitsap County.

The tribe's extensive coho database is one of the strongest in the state and is often consulted by local and state agencies for management and other informational needs.

"In the 10 years we've been doing this, we sampled well over 10,000 coho alone," he said. – T. Royal

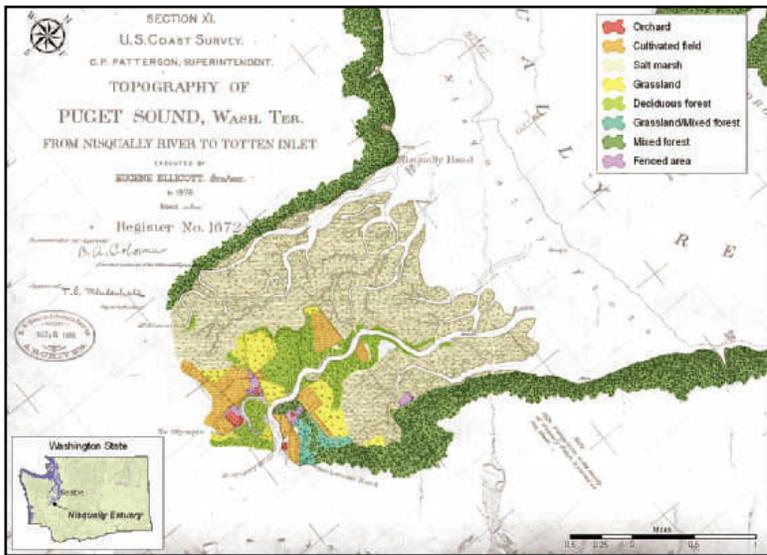


Sheet of Ice

Freezing temperatures, combined with lower water levels, froze parts of Bear Creek this winter.

The Bogachiel River tributary is one of many streams the Quileute Tribe surveys for salmon and steelhead to aid in forecasting fish returns.

Photo: D. Preston



Culvert Blocks Pocket Estuary in Sequim Bay

The approximately 4-acre Pitship Estuary has great potential as an area for salmon to feed, rear and forage, but only a half-acre of this area can be used by salmon because of a 3-foot-long fish-blocking culvert.

The Jamestown S’Klallam Tribe is partnering with North Olympic Salmon Coalition (NOSC) and the city of Sequim to help this little estuary be all that it can be. They plan to replace the culvert with a 28-foot-long bridge near the intersection of West Sequim Bay and Whitefeather roads.

“With the tribe, the coalition and the city working together, we can get more done together than trying to do it alone. In the end, the fish benefit sooner than later,” said Byron Rot, the tribe’s habitat program manager.

“These small pocket estuaries have been documented as great habitat for migrating juvenile salmon because of the freshwater and saltwater that mix here,” said Rebecca Benjamin, NOSC’s executive director. “The fish coming from Jimmycomelately Creek and Sequim Bay will no doubt benefit from this area after we replace the culvert with the bridge.”

The area doesn’t look much different from when it was mapped in the late 1800s, but the road and culvert that were installed in the mid-1900s interfere with the exchange of freshwater and saltwater – a primary function of any estuary. It also provides poor fish passage conditions and decreases the fish’s ability to access the marsh habitat.

“It’s still a salt marsh but it could be better,” Rot said. “We suspect summer chum will utilize this when it becomes available.” Summer chum are listed as “threatened” under the federal Endangered Species Act.

Project funding came from the Salmon Recovery Funding Board, North Olympic Salmon Coalition and the Jamestown S’Klallam Tribe. Construction is expected to start this year. – *T. Royal*

An aerial photo shows existing conditions in the Pitship Estuary, where a culvert prevents salmon from fully accessing 4 acres of habitat. *Photo: Jamestown S’Klallam Tribe*



U.S. Coast Survey maps are being used to plan forest restoration near the mouth of the Nisqually River. *Map: Nisqually Indian Tribe*

Historic Maps Guide the Way to Forest Recovery

The Nisqually Indian Tribe is using maps drawn by the U.S. Coast Survey in the 1800s to figure out how to replant a forest near the mouth of the Nisqually River that hasn’t existed for more than a century.

“The maps that were drawn as part of the survey were incredibly accurate and give us a good idea of where the forest was before much of this area was converted into a ranch,” said David Troutt, natural resources director for the tribe.

Restoration of the ancient forest is part of a large estuary restoration effort by the tribe and the U.S. Fish and Wildlife Service (USFWS). The tribe has restored more than 140 acres of the former cattle ranch back to estuary over the past decade; USFWS hopes to restore another 700 acres next summer.

The tribe’s Geographic Information Services department used versions of the old maps – enhanced by the state Department of Natural Resources and the University of Washington – and overlaid them with current aerial photos of the estuary. Combining old maps and new technology, tribal restoration biologists are planning the forest restoration not just on what the forest used to look like, but

also taking into consideration current conditions.

The new forest will eventually contribute large woody debris and build logjams naturally in the estuary.

“Juvenile salmon use logjams as hiding places from predators, and as a place to find food,” Troutt said. “The health of the river and of the estuary depends on there being forests nearby.”

The U.S. Coast Survey was a 19th century federal effort to plot Pacific Northwest coasts in preparation for settlement. The maps were drawn about 20 years after settlement began in the area, so some evidence of development – like fields and orchards – already are depicted. “Despite that, you can see exactly where the forest used to reach down into the estuary,” Troutt said. “We’re using what they saw to help restore habitat that has been degraded since settlement.”

He added, “It not just important to restore salmon habitat, it’s important to restore it in the best way possible. These maps give us a window into the past, to see how the forest was like before major human interference.” – *E. O’Connell*

Returning Salmon Tracked with Sonar

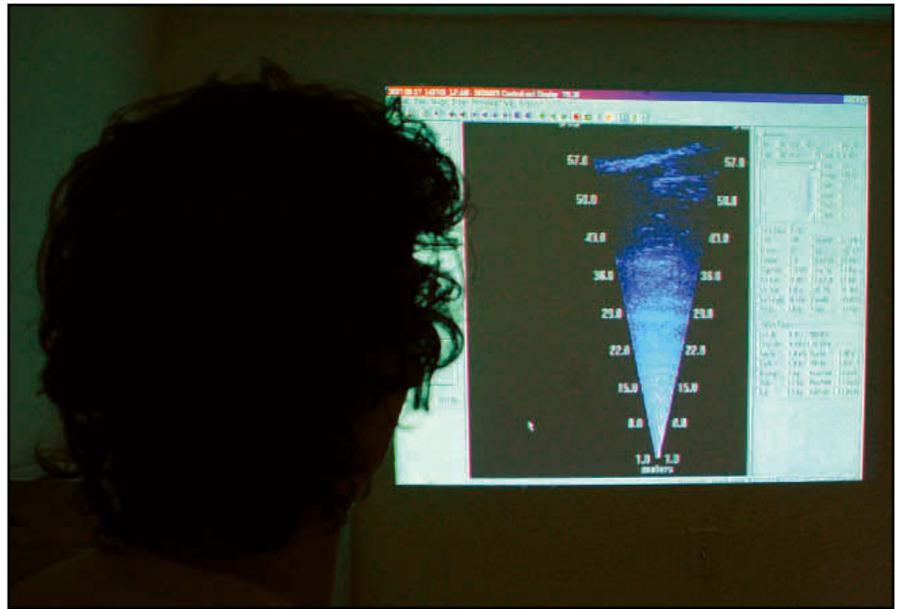
When salmon start returning in the fall, the Puyallup River is obscured by a chalky mix of glacial silt, making it almost impossible for the adult salmon to be seen. This poses a problem for salmon managers who would like to see through the murk and count every salmon.

For the past couple of years, the Puyallup Tribe of Indians has used an advanced sonar system to peer through the glacial sediment and count salmon. The tribe installed a Dual Frequency Identification Sonar (DIDSON) in the lower Puyallup River.

“If there is a larger population spawning in the glacial mainstem that we can’t see, that is something we really want to know,” said Russ Ladley, resource protection manager for the Puyallup Tribe. “Having this system low on the mainstem will also help us understand run timing a lot better.”

The images presented by the DIDSON system are black and white and are more accurate than other types of sonar. Puyallup staff regularly download data collected by the sonar and count fish back at the office. “It takes about an hour and a half to watch a day’s worth of data,” Ladley said.

Developed at the University of Washington for the U.S. Navy to find mines on ship hulls, DIDSON was quickly applied to fisheries management. DIDSON also has been used to track juvenile salmon on the Columbia River and adult spawners in Alaska.



Andrew Berger, Puyallup Tribe fisheries biologist, counts salmon as they migrate past a DIDSON sonar the tribe has stationed in the lower river. Photo: E. O’Connell

“Tracking salmon populations over the years is some of the most important work salmon managers can do,” Ladley said. After the adult salmon migration is largely over in the lower river, the tribe plans to move the DIDSON to a fish ladder in the upper Puyallup to count steelhead.

“The most basic information, like how many fish are moving through the system at any given time, is vital to salmon recovery efforts,” Ladley said. “With more information on salmon runs, everyone benefits.”

— E. O’Connell

Tribe, City Explore Boise Creek Salmon Restoration

A popular and critical reach of spawning habitat in the Puyallup River watershed is a step closer to a complete makeover by the Puyallup Tribe of Indians.

The tribe was awarded a \$120,000 grant by the state Salmon Recovery Funding Board to explore how Boise Creek could be made more hospitable to juvenile salmon.

“More chinook and steelhead spawn in Boise Creek per mile than in any other place in the watershed,” said Russ Ladley, resource protection manager for the Puyallup Tribe. “But the habitat in the creek has been degraded to the point that even if

any fish spawn or juvenile fish emerge from the gravel, they won’t have much food or many places to hide from predators.”

Both the chinook and steelhead that spawn in Boise Creek are part of larger Puget Sound stocks listed as “threatened” under the federal Endangered Species Act.

Rerouting the section of creek that flows through the Enumclaw municipal golf course, planting streamside trees and adding large woody debris to the streambed are all under consideration. The city of Enumclaw ultimately will approve any enhancement actions.

“We’re hoping we can improve the habitat to make Boise Creek a better home for salmon,” said Mayor John Wise.

“Right now there is a lack of quality habitat in a large section of the creek,” Ladley said. “We’re going to take a close look at what is possible and what will give salmon the biggest bang for the buck.”

Opening salmon passage above a series of old mill ponds also is on the drawing board.

“Salmon would be able to access more than a mile of good habitat above an impassable series of waterfalls,” Ladley said.

‘We’re going to take a close look at what is possible and what will give salmon the biggest bang for the buck.’

RUSS LADLEY,
resource protection manager,
Puyallup Tribe

“The most important thing salmon need to recover is good habitat,” he added. “This project will let us see the real potential for restoring Boise Creek.”

— E. O’Connell

Nisqually Indian Tribe

More Chinook Spawn, Thanks to Harvest Plan



Reuben Wells Jr. hoists a chinook salmon at the Nisqually Tribe's Clear Creek hatchery. Thomas Wells (right) and Emiliano Perez look on. Photo: E. O'Connell

Good harvest management by tribal and state salmon co-managers has led to more chinook reaching the spawning grounds on the Nisqually River this year, despite fewer returning chinook.

"Because we managed our fisheries the right way, we were able to reach our escapement goal," said David Troutt, natural resources director for the Nisqually Tribe. Escapement is the number of salmon that are allowed to reach the spawning grounds.

Nisqually River chinook are part of a larger Puget Sound population of chinook listed as "threatened" under the federal Endangered Species Act.

The number of chinook harvested dropped from around 20,000 in recent years to 13,000 this year. Returns to the tribe's hatcheries dropped from a high of 15,000 to fewer than 5,000. At the same time, the number of chinook reaching the spawning grounds increased from around 2,000 in recent years to more than 3,300.

To protect chinook, the tribe cut the number of fishing days by more than half and restricted tribal fishermen to a smaller section of the river.

Another benefit to chinook escapement was a new rule requiring non-tribal sport anglers on the Nisqually and nearby marine waters to release wild chinook. More than 90 percent of the chinook returning to the Nisqually this year were hatchery fish, identified by a clipped adipose fin.

"These kinds of fisheries, where there are a lot of hatchery fish and few wild fish, are effective in terminal areas like rivers," Troutt said. "But cutting fisheries alone won't matter if we don't do anything about habitat."

For over a decade, the tribe has led a community-based salmon recovery effort in the watershed. "Our communities are rallying behind recovering salmon," Troutt said. "Because of the cooperation we have here, we've made great strides in ensuring that salmon have the habitat they need when they return to spawn. For example, over the last decade the tribe has restored more than 140 acres of estuary habitat at the mouth of the Nisqually River. But we have a lot of work to do before we really recover Nisqually River chinook."

— E. O'Connell

Pipeline Grants to Restore, Protect Watershed

Demonstrating a commitment to protect and restore the Nisqually River watershed, the Nisqually Indian Tribe and the state departments of Fish and Wildlife and Ecology recently awarded five grants totaling more than \$450,000 to projects that will improve and maintain more than 60 threatened acres of the watershed. The recipients were Fort Lewis and Nisqually River Land Trust.

The five grants are part of the "Williams Pipeline Mitigation Fund," a Nisqually Tribe-administered program created to minimize the environmental harm of a new 22-mile natural gas pipeline constructed in 2006 in Pierce and Thurston counties. The construction replaced a section of pipeline that was considered unsafe.

The fund was created as a condition of local, state and federal environmental permits for the pipeline construction. The mitigation funds can be used to support projects outside the pipeline construction

zone that will provide overall improvements and protection for the watershed. To select projects, the tribe worked with Fish and Wildlife, Ecology and the U.S. Army Corps of Engineers. Biologists from Pierce and Thurston County planning departments also were involved.

"We are thrilled to support projects to improve the health of the entire watershed and protect the river for future generations of Nisqually to enjoy," said Cynthia Iyall, chairman of the Nisqually Tribe. "The total acres of habitat that will be protected or restored with these grants is more than double the area impacted by the pipeline."

"The pipeline project impacted specific sorts of habitat, like streamside vegetation and wetlands," said David Troutt, natural resources director for the tribe. "This kind of mitigation allowed us to choose projects that best addressed the needs of the watershed's ecosystem." — E. O'Connell

The Fort Lewis grant will:

- Restore 6 acres of oak and prairie habitat along Muck Creek.

The Nisqually River Land Trust grants will:

- Restore 16 acres of riverside forest.
- Permanently protect 35 acres near the Mashel River and 20 acres near Ohop Creek.
- Enhance one acre of riverside wetland on a Nisqually River side channel.

Artificial Wetlands to Treat Stormwater near Tulalip Bay



Val Streeter (left), stormwater planner for the Tulalip Tribes, and Julia Gold, environmental planner, observe stormwater runoff seeping across the sidewalk onto Totem Beach Road. Photo: K. Neumeyer

Stormwater runoff from the parking lots and playfield at Tulalip Elementary runs directly into Tulalip Bay. Traveling through conventional drains and pipes, at times seeping over the sidewalk onto Totem Beach Road, the water potentially picks up pollutants.

At the nearby Boys and Girls Club, the lack of drainage results in a parking lot pond when it rains.

As an alternative to conventional stormwater detention methods, the Tulalip Tribes are using low impact development (LID) to improve water quality and to fix several drainage problems. The tribes' Natural Resources Department is engineering wetlands to absorb stormwater and filter out pollutants before it drains into the bay.

"For fish, it's much better to address your stormwater naturally, as it would happen without us," said Val Streeter, stormwater planner for the tribes. "So that's why we're getting away from the conventional stormwater treatment – pipes, curbs, gutters, detention ponds – and moving into more natural treatment, where you don't disturb the land as much and try to mimic nature to the greatest extent possible."

'For fish, it's much better to address your stormwater naturally, as it would happen without us.'

VAL STREETER,
stormwater planner,
Tulalip Tribes

Concern about water pollution in Tulalip Bay has grown because of the increasing population in the surrounding area. Potential contaminants in stormwater runoff include dissolved metals, such as copper shavings from car brake pads. Even in trace amounts, copper can be fatal to juvenile salmon. It interferes with their alarm pheromones, making them vulnerable to predators. It also impairs salmon's breathing, brain function and sense of smell, interferes with migration and depresses the immune system.

"What an artificial wetland does is hold water, similar to a storm detention pond except you have much more soil and vegetation that you use in order to filter the water," said Julia Gold, environmental planner for the tribes.

This summer, the tribes' Natural Resources Department plans to install two catch basins in the Boys and Girls Club parking lot, to drain into a constructed wetland adjacent to an existing natural wetland. Below the playfield, an existing natural wetland will be enhanced and drainage will be improved to prevent water from flooding onto Totem Beach Road. Additional engineered wetlands will treat water from the school parking lots and improve absorption of pollutants from the runoff.

Low impact development techniques already have been successfully used at Tulalip's beda?chelh (Beh-Daa-Cha) Behavioral Health Department and Health Clinic. The beda?chelh parking lot has permeable pavement and the health clinic site uses biofiltration in addition to conventional underground water detention. – K. Neumeyer

Lummi Nation to Move Road off River Bank

The Lummi Nation has partnered with Whatcom County and the Whatcom Land Trust to realign a portion of a county road that runs past the tribe's Skookum Creek Hatchery. This section of the road segment serves primarily as access to the hatchery and a system of logging roads.

Moving the road off the bank of the South Fork of the Nooksack River will allow the tribe to restore the habitat to its natural condition, by replanting native vegetation in the riparian area and building logjams for instream cover and complexity.

The Nooksack River's South Fork spring chinook population is facing extinction, largely because of lost and degraded habitat. Restoration projects such as this one are key to recovering the population.

In January, the Whatcom County Council vacated about 3,000 feet of Saxon Road in Acme. The Lummi Nation's Natural Resources Department plans to reconstruct the road, moving it away from the river and onto the tribe's hatchery property and an adjacent parcel purchased by Whatcom Land Trust.

The land trust bought the property with a state Salmon Recovery Funding Board grant, for the purpose of salmon habitat protection and enhancement. Once the road is completed, Lummi Nation and Whatcom Land Trust will give the right-of-way to the county. The tribe also is working with Longview Timber, another adjacent landowner, to move a small section of the road off the river within its property boundary.

The tribe plans to develop a public education program that uses the Skookum Reach Habitat Restoration project site as an educational laboratory to demonstrate the steps being taken to restore endangered salmon stocks. – K. Neumeyer

Violet (Vi) Anderson Hilbert *Taq Se Blu*

Upper Skagit tribal elder Violet (Vi) Anderson Hilbert, *Taq Se Blu*, died Dec. 19, 2008 at her La Conner home, at the age of 90.

Hilbert was a world-renowned language expert, dedicated to preserving the native Lushootseed language. As Colleen Jollie, former tribal liaison for the state Department of Transportation, told the *Seattle Times*, “If you can speak Lushootseed, it’s because Vi Hilbert taught somebody, who taught somebody, who taught somebody.”

Hilbert was named a Washington State Living Treasure in 1989, and received a National Heritage Fellowship from the National Endowment of the Arts, presented by President Clinton in 1994. She founded the Lushootseed Research Center in Seattle and taught at the University of Washington and The Evergreen State College. She co-wrote Lushootseed dictionaries and grammar books, and published books of place names, stories and teachings



about Puget Sound.

Hilbert was preceded in death by parents, Louise Jimmy and Charlie Anderson; husband, Henry Don Hilbert; sons, Denny Woodcock and Ron Hilbert-Coy. She is survived by daughter Lois Schluter and her husband, Walter; and numerous grandchildren, countless friends, colleagues and adopted relations.

Makah Grandmothers Walk for Treaty Rights

Three Makah grandmothers walked most of the way from Neah Bay to Portland – more than 300 miles – to draw attention to the treaty rights of all Indian people.

Gail Adams, Dotti Chamblin and Rhonda Markishtum spent several weeks making the journey, carrying signs urging state and U.S. governments to up-

hold the obligations contained in treaties signed with Indian tribes.

“We weren’t doing it just for our tribe, we did it for all tribes,” Adams said. High on their list of priorities were topics such as health care, domestic violence, the tribal court system and the Makah Tribe’s treaty right to whale.

“We’re supposed to be covered as long as the grass grows and water flows,” Adams said. “I’m concerned the health care obligation is not being met now, that the standard of care is low and that care will not be there for future generations.”

Chamblin attends many regional and national gatherings of tribal governments such as Affiliated Tribes of Northwest Indians and National Congress of American Indians.

“She kind of lit a fire under us and we started doing a lot of research into the law and treaties,” Adams said.

The women walked to Portland’s Bureau of Indian Affairs office via Port Angeles. They also made stops at the federal courthouse in Tacoma and took up post on the steps of the state legislature in Olympia.

“In Sequim and Bremerton, people asked a lot of questions

and were very supportive,” Markishtum said.

Timely gifts also kept them going, from donors such as Chamblin’s doctor, an employee of the Bureau of Indian Affairs office in Portland and the Coeur d’Alene Tribe in Idaho.

“Gail and I decided to drive to the National Congress of American Indians (NCAI) meeting in Phoenix, Ariz., after we got to Portland,” Markishtum said. The donation from Coeur d’Alene got the women to Phoenix and a place to stay.

The drive through other native lands impressed upon the women the needs of all Indian people.

“Other folks have it worse in Indian Country,” Markishtum said. “That’s why it is so important that we continue to speak up about treaty rights.”

– D. Preston



Makah tribal members Gail Adams (left) and Rhonda Markishtum display signs they carried on their journey from Neah Bay to Portland. Photo: D. Preston

Biogas Plant Puts Cows to Work for Salmon



About 1,000 Werkhoven Dairy Farm cows are powering a new biogas plant on Tulalip tribal property. Profits from the plant will help pay for future salmon restoration projects. *Photo: K. Neumeyer*

A new biogas plant on Tulalip tribal property in Monroe is creating more than energy; it's also generating revenue for future salmon restoration projects.

Qualco Energy, a nonprofit formed by the Tulalip Tribes, the Sno/Sky Agricultural Alliance and Northwest Chinook Recovery, has a contract with Puget Sound Energy to sell the power generated by methane produced by cow manure. Qualco's biodigester has been operating since December, consistently producing 450 kilowatt hours of energy – enough

to power about 300 homes.

"We got involved because we wanted to get some of the nutrients and bacteria out of the water," said Daryl Williams, Tulalip environmental liaison and executive director of the tribe's Quil Ceda Power company. "When we start to bring in money, it will help pay for some of the habitat restoration projects we have planned."

The Tualco Valley, where the Snoqualmie and Skykomish rivers join to form the Snohomish River, is home to thousands of acres of farmland. Waste from dairy farms has been

blamed for increased levels of fecal coliform and a decline in the water quality of nearby rivers.

Qualco's biogas plant converts dairy farm manure into methane gas, which fuels a generator to produce electricity. The leftover liquids go back to the farms to be used as fertilizer, and the biosolids are composted on site to be sold to local soil companies.

So far, 1,000 cows from the Werkhoven Dairy Farm are providing the manure, but additional farmers are expected to sign on.

Not only does the process keep dairy farm waste out of the rivers, but it also improves air quality by reducing the greenhouse gases released by methane. And byproducts from chicken farms and cheesemakers are feeding the biodigester instead of winding up in county sewers.

"Cheese whey makes the digester more efficient," Williams said. "Cheese whey and manure work well together for increasing the release of methane."

– K. Neumeyer