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# We Have to be Salmon Tough

By Billy Frank Jr.  
NWIFC Chairman

We need to be as tough as the salmon themselves if we're going to see their recovery.

South Fork Nooksack River native spring chinook are almost extinct and need our help. It wasn't long ago when about 13,000 of these early-timed chinook came back to the river each year. They were the first salmon to arrive each spring, feeding Indian people after long winters, when no other salmon were in the river.

Spring chinook have a much tougher journey than other salmon because they spend more time in fresh water before spawning. They are especially sensitive to poor habitat conditions in the river.

Time has not been kind to salmon habitat in the South Fork Nooksack. The loss of trees and other plants along streams has removed important shade and reduced the source of wood needed for in-stream fish habitat. Spring chinook need deep, sheltered pools of cool water for their extended rest before they spawn. Water that is too warm can result in disease, reduced salmon egg survival and even death.

This summer, to give the river the building blocks it needs to restore degraded habitat, both the Lummi Nation and the Nooksack Tribe built specially engineered logjams in the South Fork. Over the next few years, these logjams will help create the deep pools that young and adult salmon prefer.

While we are fixing the habitat, we also have to make sure that we are protecting the unique genetic traits of these fish. The Lummi Nation and the Nooksack Tribe are working with the state Department of Fish and Wildlife and the National Oceanic and Atmospheric Administration on an important program to raise juvenile South Fork Nooksack River chinook in captivity and spawn them. Their offspring will be released in the river to migrate naturally and return as adults a few years later.

Our goal for this stock is the same for all wild salmon stocks: to recover their populations to levels that can again support harvest. By taking these naturally spawned juvenile chinook into protective custody, the tribes are safeguarding their future.

The path to recovery takes a side-by-side approach of boosting numbers now while also fixing the habitat so the river can support a healthy, productive population. I'm proud that the tribes are taking a leadership role in both areas.

Salmon face great challenges during their life journey. With their numbers falling, we have to work harder to help them on their way. As long as they continue to swim upstream, so should we.



## NWIFC News

Northwest Indian  
Fisheries Commission  
6730 Martin Way E.  
Olympia, WA 98516  
(360) 438-1180

NWIFC News is published quarterly. Free subscriptions are available. This edition is also online at [www.nwifc.org](http://www.nwifc.org). Articles in NWIFC News may be reprinted.

**NWIFC Executive Director:** Mike Grayum; **Information and Education Services Division Manager:** Tony Meyer; **Contributing Editor:** Steve Robinson; **Regional Information Officers:** Debbie Preston, Coast; Emmett O'Connell, South Sound; Tiffany Royal, Hood Canal/Strait of Juan de Fuca; Kari Neumeyer, North Sound; **Editorial Assistant:** Sheila McCloud

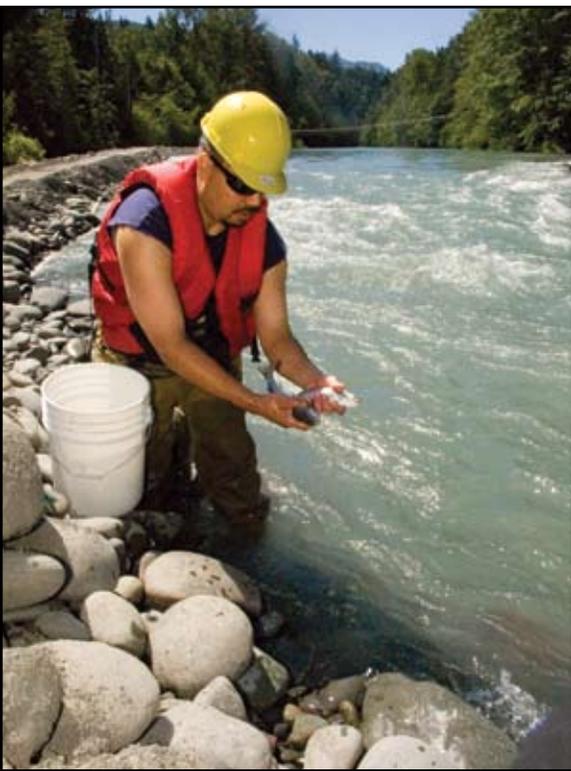
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**On the Cover:** The West Shore Canoe Family of the Lummi Nation paddles to shore on the Swinomish Reservation during the annual Tribal Canoe Journey. (See story, Page 4) *Photo: K. Neumeyer*

# Elwha Rescue Fish From Rerouted River



Lower Elwha Klallam tribal crews raced against the clock for several days in July to rescue fish from a 300-yard section of the Elwha River that was dewatered to enable construction of a new water treatment plant.

Dodging construction equipment, brush and boulders while navigating the newly rerouted Elwha River, tribal staff hauled 5-gallon buckets full of steelhead, coho, chum and other species from pools of water in the original streambed.

The new water treatment facility will serve Port Angeles' industrial water needs. It will also help remove excess

*Left:* Tribal biologist Ray Moses releases fish into the newly rerouted Elwha River. *Above:* Garth Hopie, Alan Charles, Melvin Sampson, Ray Moses and Floyd Cooke of the Lower Elwha Klallam restoration crew gather a seine net in one of the remaining pools of water in the Elwha River channel. *Photo: T. Royal*

sediment following the removal of the river's two dams, the 108-foot Elwha Dam and the 210-foot Glines Canyon dam, which are scheduled for removal beginning in 2012. The river will be rerouted to its original channel in October, and will provide water to city of Port Angeles following dam removal.

"The reconstructed channel and intake system is an improvement over the old water withdrawal," said Raymond Mo-

ses, tribal biologist. "The reconstructed channel has been designed to pass all species of salmon, allowing future access to upriver habitats."

The dams were built in the early 1900s to provide hydroelectric power to the Port Angeles area. Both dams were built without fish ladders. Currently, salmon and steelhead can only spawn below the dams, in the lower five miles of the river.

— T. Royal

## Water Agreement Protects Salmon in White River



The Muckleshoot and Puyallup tribes have reached an agreement with a coalition of local governments to protect salmon in the White River, while also allowing some communities in King County access to the river's water.

"For almost a century, the flow of the White River through the Muckleshoot Reservation was often reduced to a trickle by diversions into Lake Tapps," said Charlotte Williams, Muckleshoot tribal chair.

The agreement between the tribes and the Cascade Water Alliance leaves enough water in the river to support salmon populations throughout the year. For almost a century, a portion of the White River's flow was diverted as part of a now-defunct hydroelectric project.

"We're happy we came to an agreement," said Henry John, a Puyallup tribal council member. "This debate could have ended up in court, but we agreed that the best thing to do was the best thing for the salmon." — E. O'Connell

James Miller, a technician at the Muckleshoot Tribe's White River hatchery, handles a spring chinook. *Photo: E. O'Connell*

# Water Probes Successful During Canoe Journey



USGS research geologist Eric Grossman checks the canoe water quality probe. *Photo: John Clemens, USGS*

As the Swinomish canoe family paddled through the San Juan Islands to Cowichan, B.C. for this year's Tribal Canoe Journey, they collected important water quality data along the way. Information such as temperature, salinity, oxygen levels and turbidity was taken at 10-second intervals from a water quality probe towed behind the

canoe. The data was posted online at the end of each day on the U.S. Geological Survey's (USGS) Web site ([www.usgs.gov/coastsalish](http://www.usgs.gov/coastsalish)). The Canoe Journey provided a unique opportunity for research, because water quality data collected from a canoe isn't tainted by exhaust or turbulence from a motorized boat.

This summer, canoes towed water quality probes along the routes beginning at Swinomish, Squaxin Island and Skokomish, as well as the Sto:lo and Homalco first nations in British Columbia. Puget Sound and the Strait of Georgia – a region known traditionally as the Salish Sea – suffers from deteriorating water quality that threatens most nearshore and marine

habitats.

"You just look around and see that everything has degraded," said Swinomish Chairman Brian Cladoosby. "Our goal is to try to make the Salish Sea something that our children, grandchildren and seven generations down the way will be proud of – something we will leave in better

shape than when we received it."

The data collected this year provides a baseline map to compare with data collected during future Tribal Canoe Journeys, and could reveal areas of concern for scientists to study more closely, said USGS research geologist Eric Grossman, who provided technical assistance during the journey. Based on the preliminary data, Grossman noticed an unusually warm water temperature of 71 degrees in Hood Canal, along with more jellyfish than other areas.

"Jellyfish can be indicative of poor water quality," he said. "They can be the last ones to thrive in poor water quality conditions."

In the future, the project could expand to include additional tribes and science activities.

"The hope is to integrate the traditional local knowledge of the Coast Salish people," Grossman said. "They've lived off these waters for thousands of years and they have an understanding of the different characteristics of the environment such as where fish were plentiful and where eelgrass grew. We might be able to marry western science with the longstanding Coast Salish knowledge to better understand recent ecosystem changes and trends."

– K. Neumeyer



## Generations

From left: Nooksack tribal members Jack Jimmy, Mary Tuchten, Mariah Johnnie and Louisa George gather by the tribe's smokehouse in the early 1900s.

The meeting house on Anderson Creek was built from split cedar boards about 16 feet long. It was the seat of tribal councils and celebrations.

*Photo courtesy of Nooksack Indian Tribe*

# Skokomish Starts Chinook Program

A tanker truck has given a lift to the goal of re-establishing natural chinook production in the upper South Fork Skokomish River. Throughout September, the Skokomish Tribe and Washington Department of Fish and Wildlife (WDFW) staff hauled adult salmon to the far reaches of the Skokomish River watershed. The fish are returns to the state's George Adams Hatchery.

By mid-September, employees from the tribe and WDFW had collected and transported about 400 adult chinook. Additional supplementation is planned for 2009.

The fish were released in the upper South Fork of the Skokomish River at a site near the confluence of LeBar and Brown creeks, about 15 miles upriver from the George Adams Hatchery near Shelton. The chinook are expected to disperse both upstream and downstream of the release site and help seed the watershed.

The pilot program calls for monitoring the spawning success of the adult salmon released into the river as well as their out-migrating offspring. Dispersal patterns, spawning distribution and spawning timing of the fish will be examined. All of the adult fish released are tagged for identification with individually numbered spaghetti-type tags to distinguish them from any adults migrating naturally into the South Fork.

A screw trap that safely captures young out-migrating salmon will be used to assess the spawning success of the transplanted adults beginning in 2009. The joint chinook supplementation

project being conducted by the tribe and WDFW is aimed at restoring some or all of the historic distribution of natural chinook to the South Fork. Restoration of these fish is an integral part of the recovery of this species in the Skokomish watershed.

The George Adams hatchery pumps out large numbers of chinook, which contribute to sport and commercial fisheries in the region. Genetic tests have shown, however, that chinook spawning in the river are not only lower in number, they are virtually identical to those coming back to the hatchery. Historically, the South Fork was a significant producer of chinook salmon. The river produced both spring and summer/fall populations of chinook. Work is also moving forward to re-establish spring chinook in the North Fork.

"Together with other efforts in the chinook recovery plan, such as habitat restoration and improved passage in the Skokomish watershed, this project is expected to contribute significantly to population recovery," said Cindy Gray, the tribe's finfish management biologist. — *T. Royal*

## Nisqually Wildlife Refuge Restoration Begins

The largest estuary restoration to date in Puget Sound got under way earlier this summer at the mouth of the Nisqually River. The project by the U.S. Fish and Wildlife Service is be-

ing conducted in cooperation with the Nisqually Tribe.

During the past decade, the tribe restored more than 140 acres of estuary on tribally owned land at the mouth of the Nisqually River.

"This restoration will be a big benefit for not only salmon, but for so many species that live at the mouth of the Nisqually River," said Jean Takekawa, manager of the Nisqually National Wildlife Refuge. "We've been able to make this progress because of the great partnerships here in the Nisqually watershed and beyond."

Construction began on a new inner dike at the Nisqually River Wildlife Refuge that will protect several buildings after 5 miles of dikes are removed starting next year. Once the dikes are removed, more than 700 acres of estuary will open to the tides.

"Restoring the estuary is the most significant step that we can take to bring strong salmon populations back to the Nisqually River," said David Troutt, natural resources director for the tribe. Chinook and steelhead in the Nisqually are both listed as "threatened" under the federal Endangered Species Act.

Monitoring of the tribal restoration site has shown that many species, including threatened salmon, benefit from the restoration. "We've seen rebounding bird, insect and fish populations since the dikes were pulled out," Troutt said. "We expect the same kind of results on a much larger scale when the full restoration is complete." — *E. O'Connell*



From left: David Troutt, natural resources director for the Nisqually Tribe, Rep. Norm Dicks (D-Belfair), and Puget Sound Partnership Executive Director David Dicks listen to Jean Takekawa, manager of the Nisqually National Wildlife Refuge, describe the recent estuary restoration project. *Photo: E. O'Connell*

# Oil Spill Crew Ready for Response



Makah crewman Bill Lawrence stands in the front of the oil skimmer Arctic Tern during an oil spill drill. Photo: D. Preston

Like a hungry bird with a wide open mouth, the 73-foot-long *Arctic Tern* oil spill response vessel opens its skimming doors wide in Neah Bay Harbor during weekly oil spill drills. The recently acquired vessel and its crew of two from Neah Bay are part of the Makah Tribe's effort to effectively respond to oil spills that threaten their community and natural resources.

The Makah Tribe has worked hard to get as much mechanical oil spill response equipment stationed in Neah Bay as possible,

following spills of more than 3 million gallons in their waters. Natural resources such as fish, marine mammals and other cultural resources were devastated. In the past decades, the tribe has pushed in federal and state forums to obtain better protection for the coast, where more than 15 billion gallons of oil move through Makah tribal waters annually.

The tribe prefers mechanical retrieval, because using chemical dispersants means environmental trade-offs, such as killing fish larvae rather than having oil wash up onshore.

"Once oil is in the water, it's all about setting up the command center and understanding the environmental trade-offs," said Chad Bowechop, marine manager of the tribe's Office of Marine Affairs.

The tribe's efforts to retain more spill response equipment led to Neah Bay being designated as a primary staging area for oil spill response by Washington state. That led to the stationing of the Marine Spill Response Corporation (MSRC) vessels *Arctic Tern* and the 40-foot *Loon*. The crew of the *Arctic Tern*, which includes Makah tribal member Bill Lawrence and Neah Bay resident Dwight Tevuk, trains regularly on a variety of vessels. The tribe continues to work to stabilize funding for a rescue tug stationed in Neah Bay

which has responded to 41 ships since 1999, preventing incidents from becoming spills. This is the first year the tug has been stationed year-round and the tribe is working with Congressional representatives to assure it stays year-round.

"There's no good season for an oil spill," said Bowechop.

Most recently, the tribe was appointed as a member to the Regional Response Team (RRT), one of 13 such teams that make up the National Response Team. They are the first tribe on the West Coast to be appointed to an RRT.

"Up until now, tribal interests were minimally represented at the regional or national level," said Bowechop. By working to understand the structure of spill response and becoming active in the state, U.S. Coast Guard and Environmental Protection Agency processes, the tribe has become a leader in protecting its own resources. There is now language in the Northwest Area Oil Spill Plan that recognizes the requirement to consult with the Makah Tribal Council regarding conditional approval for using chemical dispersants with Makah treaty-protected waters.

"We're part of the decision-making process now," Bowechop said.

— D. Preston

## Makah Water Testing Protects Public Health

Ray Colby instinctively knows where to find the mushroom rock near Seiku in the Strait of Juan de Fuca. Although there is a GPS unit on board the boat, Colby, a Makah tribal member, uses visual references to direct Jule Schultz, environmental specialist for the state Board of Health, to the water sampling site.

Colby, water quality specialist for the tribe, and Schultz are taking water samples at 18 sites along the coast from near Pillar Point to Neah Bay. The samples are tested for fecal coliform levels (animal and human waste).

"It's a cooperative project with the state," said Jim Medlen, acting sustainable resources coordinator for the tribe. "By cooperating, we're able to gather more data than we would otherwise."

Testing occurs once every other month. Technicians test for various water quality indicators such as fecal coliform, dissolved oxygen and temperature. Knowing fecal coliform levels alerts the tribe to the possibility of shellfish contamination.

Developing a baseline of water quality data enables the tribe to better assess impacts of various activities such as logging in the watersheds. Aquatic life is the most sensitive indicator of water quality. — D. Preston



Ray Colby, Makah tribal member, collects a water sample near Seiku as part of regular sampling by the Makah Tribe and the state Department of Health. Photo: D. Preston

# Makah Youth Shadow Natural Resources Staff

Ariela Rascon scrunches up her nose at the smell emanating from the river otter she is about to cut open, but confidently slices its stomach open anyway. The 18-year-old Makah tribal member is learning to perform a necropsy (animal autopsy) to determine the cause of death, as part of the tribe's summer youth program. Students learn about various natural resource jobs within the tribe by job-shadowing employees and performing some of the same tasks. "I like the program," Rascon said. "It's interesting and I've learned a lot."

While Rascon is dealing with a river otter, two other Makah tribal students are performing necropsies on a harbor porpoise and a harbor seal. The animals were found washed up on the beaches near Neah Bay. Marine mammal biologist Jonathan Scordino stored them in a freezer until the necropsies could be performed. The students performed their work under the supervision of both Scordino and Pat Gearin, a marine biologist with the National Marine Fisheries Service's National Marine Mammal Lab.

"It's common to find harbor seal pups

who haven't figured out how to find food," Gearin told Dominick DeBari, 18, and Ernie Grimes, 21. Gearin pointed out the thin layer of blubber on the pup that DeBari had cut open. "That's a sign of not getting enough food," Gearin said.

As part of their work, Scordino had the students read the Environmental Impact Statement on the tribe's request for an exemption from the Marine Mammal Protection Act to continue their treaty right to whale. Students also help collect water quality samples and answer the phone for the fisheries department.

"We started this program five years ago when we as a staff talked about the need to promote fisheries and natural resources management to the next generation," said Russ Svec, fishery manager for the Makah Tribe. "We hope to not only spark student interest in fisheries management, but through their experience, promote a better understanding of our native culture and environment.

"We want to connect them to those stories our elders told us, to create the passion about what we have and to protect it for tomorrow." — *D. Preston*



Dominick DeBari, 18, performs a necropsy (animal autopsy) on a harbor seal pup, while Ariela Rascon, 18, does the same on a river otter. *Photo: D. Preston*

## Puyallup Building a Home for Juvenile Salmon

The Puyallup Tribe of Indians is reclaiming some old stomping grounds for salmon. This summer the tribe reconnected a historic river channel to the Puyallup River, restoring important habitat for baby salmon.

"Salmon will get a lot of benefit from reconnecting the wetland to the mainstem of the Puyallup River," said Bill Sullivan, natural resources director for the tribe. "One of the most pressing needs for salmon on the Puyallup River is off-channel habitat."

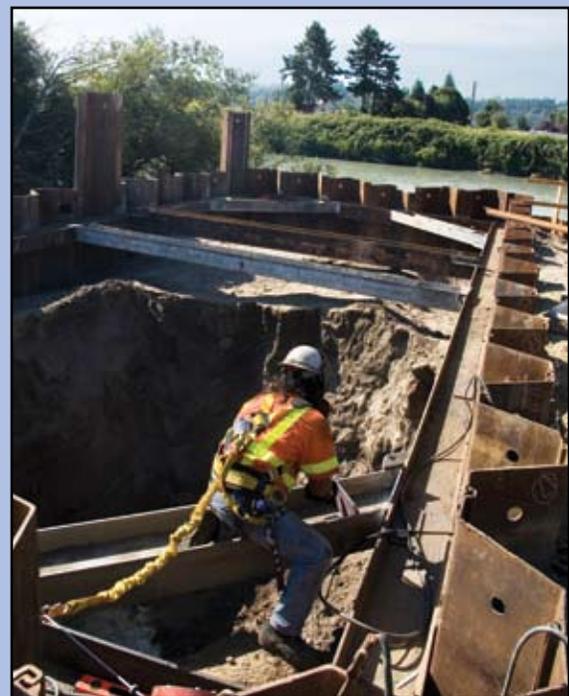
The tribe is reconnecting the 17-acre Sha Dadx wetland to the river. Good habitat for young salmon will be created when the wetland is reunited with the river through a large box-culvert under the main river dike. The tribe will protect properties adjacent to the wetland with a new dike.

Off-channel habitat is any portion of the river where juvenile fish can swim out of the main river's flow to rest and feed. It takes the form of small sidechannels, tributary creeks or even wetlands connected to the mainstem.

"Historically, the Puyallup River was able to use its entire floodplain, carving new paths and creating new off-channel habitat for salmon," said Russ Ladley, resource protection manager for the tribe. "Since we started diking and building in the floodplain, a lot of off-channel habitat has been lost."

Most of the lower Puyallup is closely constrained by dikes, making the damage of winter floods worse on salmon.

In addition to the Sha Dadx project, the tribe has also worked with the South Puget Sound Salmon Enhancement Group to restore two off-channel sites farther up the watershed near Orting. All three projects were identified in a Puyallup tribal study as ideal places for off-channel restoration. — *E. O'Connell*



A new culvert will allow juvenile salmon to access a large oxbow wetland on the banks of the Puyallup River. *Photo: E. O'Connell*

# Salmon Habitat Improved by

## Quinault Indian Nation Begins Watershed Repairs

Historically, Quinault River sockeye had more than 55 miles of spawning habitat from the mouth of Lake Quinault to the Olympic National Park border. Today there are fewer than 3 miles of spawning habitat corresponding to a precipitous drop in sockeye populations. Halting the erosion of remaining spawning habitat and creating more is a goal of the Quinault Indian Nation (QIN).

As part of that effort, 13 logjams are being installed now to protect one of the few remaining sidechannels that sockeye use to spawn near Lake Quinault. The \$1.2 million project involved many partners and extensive cooperation from local landowners.

Each jam will contain 200 pieces of wood, most of it provided by Olympic National Park. The trees were road blow-down from a massive December wind storm.

To encourage the creation of stable logjams, QIN will engineer some structures in several locations that will later

*Editor's Note: Engineered logjams are playing an increasingly important role in salmon recovery. The following stories show how tribes across western Washington are using logjams to restore salmon habitat.*



A contractor pounds a 40-foot tree into the floodplain of the Quinault River as part of the QIN's initial spawning habitat with the creation of engineered logjams and plantings of native trees. *Photo: D. Preston*

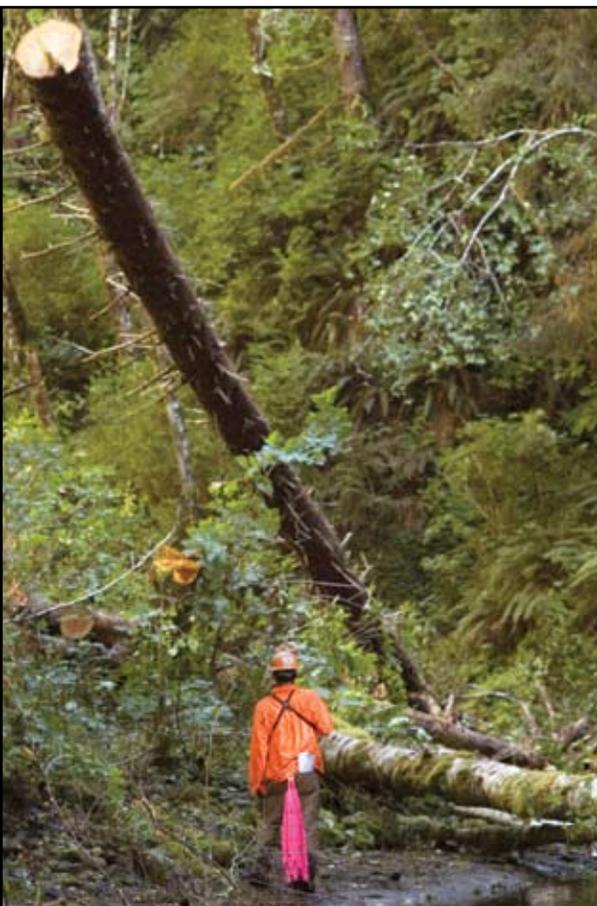
be planted with more than 5,000 native species of trees annually. Black cottonwood and fast-growing conifers such as sitka spruce and Douglas fir will be used.

"It's encouraging to begin this project," said Ed Johnstone, fisheries policy for QIN. "We're still working to finish raising the funds for this phase so we can get it all done now. It costs a lot to mobilize all this equipment, so getting it done all at once is important."

By completing two years of work in one season, QIN will save

an estimated \$130,000.

"It's part of the learning curve," said Larry Gilbertson, senior resource manager. "We planned to complete eight logjams this season, but we saw the opportunity to complete it all in one season. It's a great opportunity to do it." — *D. Preston*



## Quileute Adds Habitat to Hyas Creek

A 33,000-acre fire that roared through the forests near Forks in 1951 sparked a chain reaction of events that significantly impaired salmon runs in the Calawah River drainage, particularly tributary creeks like Hyas Creek.

"After the fire, the subsequent timber salvage efforts resulted in removal of most of the wood from the stream, impairing fish habitat," said Frank Geyer, Timber/Fish/Wildlife biologist for the Quileute Tribe. "That meant that most of the larger logs that would have contributed to fish habitat in the stream were gone."

Early this fall, in partnership and cooperation with the Pacific Ranger District of Olympic National Forest (ONF) and Rayonier Inc., the tribe contracted with Columbia Helicopters to return hundreds of huge logs to Hyas Creek to help restore fish habitat. More than 30 log structures were created in the creek, using wood provided by ONF. The jams will help reduce the velocity of the stream, trap sediments and create habitat where fish can rest, hide and spawn.

"It was a unique situation where the national forest district had timber available adjacent to Hyas Creek," said Geyer. "That really helped reduce the cost of the project because we didn't have to find big trees and truck them in."

The majority of these large trees will stay in the creek during high winter flows, collecting woody debris being swept downstream. The log structures will help the area until existing riparian trees can start to contribute to habitat in the creek.

— *D. Preston*

Nate Aniballi of Columbia Helicopters uses a two-way radio to tell the helicopter pilot how a log is to be placed in Hyas Creek near Forks during a salmon restoration project headed by the Quileute Tribe. *Photo: D. Preston*

# Engineered Logjams

## Tribes Restore Habitat in South Fork Nooksack River

This summer, both the Nooksack Tribe and Lummi Nation continued their efforts to restore degraded habitat in the South Fork Nooksack River, where the native spring chinook population is dangerously close to extinction.

Over the years, the loss of streamside vegetation has removed shade and reduced in-river woody debris. Water that is too warm can reduce survival of salmon eggs and can also result in disease or death.

In separate projects, the tribes constructed multiple logjams to scour sheltered deep pools and improve the spawning, rearing and holding habitat for salmon.

In the South Fork near Todd Creek, the Nooksack Tribe used a crane to drive

pilings and an excavator to place logs for eight logjams. The crane worked between the existing riparian trees, reducing the need to remove them during the project.

The Lummi Nation used existing wood and helicopter in additional logs to build eight jams in Nessel's Reach. By using helicopters, the tribe minimized the environmental impact, because it didn't have to build roads to bring in the wood by truck.

Deep pools with cover are the preferred holding habitats for chinook. The goal is for the logjams to create this habitat in waters that are cooler, either because they are downstream from the confluence of tributaries or in areas influenced by groundwater.

— K. Neumeyer

project to protect and restore sockeye  
preston

g process of this pilot project," said  
research scientist for QIN. "We had  
or nine jams the first year, and then  
ng year and complete that stretch of  
advantage and the possibility of com-  
because we have most of the wood



Inner-tubers float by the Nooksack Tribe's crew building an engineered logjam in the South Fork Nooksack River near Todd Creek.

Photo: K. Neumeyer

## Lower Elwha, Makah, DNR & Rayonier Complete River Restoration

A joint effort of the Lower Elwha Klallam and Makah tribes, the state Department of Natural Resources (DNR) and Rayonier Forest Resources L.P. has been successful in restoring an important part of the Hoko River as a thriving feeding

and spawning ground for fish and other wildlife.

The restoration site is at the confluence of two major Hoko River tributaries, Ellis Creek and Creek 191, about 50 miles west of Port Angeles and 20 miles northwest of Forks. The creeks run through state trust forests managed by DNR and private Rayonier forests.

Salmon habitat was lost to old logging practices that clear-cut streamside (riparian) areas and left the streams without the ecosystem that salmon need to survive, including tree shade and food sources. Coastal chinook, coho, steelhead, cutthroat trout and chum are commonly found in this watershed.

Restoration work included removing a fish-blocking, 8-foot-diameter culvert and 3,500 cubic yards of fill, opening up nearly 1.5 miles of excellent salmon habitat on Creek 191.

Crews also removed two log bridges that restricted the river channel's flow. A series of nine engineered logjams were installed in the river, using more than 300 large logs with root wads throughout the half-mile stretch of the restoration area. Nearly 100 additional logs were brought in by helicopter and placed within a one-mile reach of Ellis Creek. The log additions create habitat important for salmon to feed and rest. — T. Royal

A rootwad and log are relocated to the Hoko riverbed. Photo: NEC Construction Management



# Cooperation Protects Headwater Streams



NWIFC technician Frithiof Waterstrat (left) records measurements while graduate student Cristina Dressel and NWIFC ecologist Ash Roorbach use an infrared beam to determine tree length in the Olympic Peninsula's Clearwater River basin. *Photo: D. Preston*

Cristina Dressel kneels precariously on a log spanning a creek burlbling 20 feet below her. Crawling the length of the log, she measures and records the length and diameter before crawling backward to firm ground.

"My mother just assumed this job was safer than others I considered this summer," Dressel jokes. Measuring fallen logs is just one way the graduate student will help create a baseline picture of streams prior to timber harvest.

It's part of a larger research project by the Cooperative Monitoring, Evaluation and Research Committee (CMER), a management tool of the Forests and Fish Report (FFR). FFR is a landmark adaptive management agreement among tribes, the state, private timber companies and environmental groups to protect fish and wildlife habitat and preserve the timber industry.

A major component of the agreement signed in 2000 was leaving a 50-foot buffer of trees on either side of all non-fish bearing streams, frequently the headwater of streams too steep to allow fish.

"The research is designed to improve our understanding of how those streams respond to different kinds of harvest practices," said Dave Schuett-Hames, CMER Monitoring Coordinator for the

Northwest Indian Fisheries Commission (NWIFC).

Different rates of harvest within buffer zones will be completed, including no harvest. Data will be collected for two years following harvest to compare the changes in the buffer zones over time.

Headwater streams connect the upslope areas managed for timber production with downstream fish habitat. They transport wood, nutrients and invertebrates to larger streams inhabited by fish. Stream-side buffers provide shade to keep water temperatures low, which is important to salmon. The cooperative research project involves several partners:

- Washington Department of Fish and Wildlife is collecting amphibian data that will determine the baseline population prior to timber harvest.
- A group from NWIFC is recording the size, location and function of downed wood within the buffer as well as describing the condition of the streamside trees.
- Washington Department of Ecology is collecting stream insect numbers, amount of shade, water quality and amount of decaying plant matter found in the stream. – *D. Preston*

## Tulalip Forest Enterprise Cutting Trees to Grow Trees

The Tulalip Tribes are thinning 132 acres of trees in the northwest corner of the reservation, making an investment in their 8,000 acres of forestlands.

When too many trees grow too close to each other, forest growth is slowed. The tribe plans to reduce density from 400 trees per acre to 160 trees per acre. Removing stunted and malformed trees will allow healthier trees to grow to their full potential. With more sunlight reaching the forest floor, understory can grow, benefiting the wildlife that feeds on it.

Although the thinned trees have little commercial value, the tribe plans to sell the wood for pulp and lumber.

TimberTec, a Bellingham logging company, was contracted to harvest the mostly Douglas fir trees.

"After we thin, the trees grow more quickly, which means a better, more profitable final harvest," said Jason Gobin, Tulalip tribal member and forestry co-manager.

Not only is forest preservation important to the commercial industry, but it also is tied to the Tulalip culture. Tulalip's Lushootseed Language Department takes students to the forest to learn more about traditional plant uses.

"Keeping the forests healthy allows tribal members to practice their culture through hunting, gathering of berries and herbs, and the use of cedar to make baskets, hats and clothing."

said Mytyl Hernandez, Tulalip tribal member and public affairs coordinator.

Since the Tulalip Tribes adopted a Forest Management Plan in 1978, nearly 4,000 acres of timberland has been harvested and 1,600,000 seedlings planted.

"The forestry program is a blend of tribal values," said Glen Gobin, Tulalip Tribes board member. "We're trying to preserve the forest for future generations." – *K. Neumeyer*

Tulalip Tribes forestry co-manager Jason Gobin (right) and recently retired forestry manager Terry Grinaker oversee forest thinning on the Tulalip Reservation. *Photo: K. Neumeyer*





## *Restoration in Skagit Watershed Under Way*

Research scientist Greg Hood and restoration ecologist Nora Kammer of the Skagit River System Cooperative check out the progress on the removal of fill from the Swinomish Channel. *Photo: K. Neumeyer*

Restoration efforts in the Skagit River watershed made headway this summer with two projects aimed at undoing past destruction of salmon habitat.

At the South Fork of the Skagit River delta, crews are returning tidal flow to about 150 acres of a former estuary. The parcel of land, known as the Headquarters Unit of the Skagit Wildlife Area, was converted from salmon habitat to a recreational area in the 1960s – using dikes, drainage ditches, culverts and tide gates.

Construction crews will remove approximately 6,500 feet of the old dikes and levees, allowing the tides and the river to reclaim the area. In preparation, crews are building a new setback dike farther inland along the border of the wildlife area and installing a new, larger tide gate upstream on Wiley Slough.

The Skagit River System Cooperative – the natural resources arm of the Swinomish and Sauk-Suiattle tribes – is working on the project with the Washington Department of Fish and Wild-

life (WDFW) along with other partners.

The work was set to begin last year, but was delayed after recreational interests raised objections to the loss of the hunting and wildlife viewing area. To address concerns about lands lost to hunting, WDFW is working with a coalition of hunters, wildlife enthusiasts, farmers and other landowners to secure hunter access to private lands in the area.

On the Swinomish Reservation, the tribe is removing some of the spoils that were dumped on top of marsh habitat when the Swinomish Channel was dredged 70 years ago.

The excavation will return flooding to the marsh, allowing unrestricted movement of sediment, nutrients and fish. The Swinomish Channel is an estuarine corridor connecting Padilla Bay to Skagit Bay, where salmon habitat is limited. Padilla Bay is filled with eelgrass meadows that provide rearing habitat for juvenile chinook and other salmon during the early phase of their oceanward migration. – *K. Neumeyer*

## **Swinomish Tribe Wins Suit Against Illegal Tide Gates**

Three tide gates in the Skagit River delta were replaced by the dike district in violation of the Clean Water Act and Endangered Species Act, a federal judge ruled Sept. 5.

The Swinomish Tribe filed the suit accusing Skagit County Dike District No. 22 of violating the Clean Water Act by failing to get permits from the U.S. Army Corps of Engineers before replacing the tide gates. The judge also found that the

district violated the Endangered Species Act because the tide gates resulted in a significant take of protected juvenile chinook by blocking access to necessary rearing habitat.

The tribe sued the dike district after several years of trying to reach an out-of-court solution. At the tribe's request, the court did not penalize the district or otherwise specify a remedy, but ordered the parties to work together to attempt to

negotiate a solution that was satisfactory to everyone by Oct. 17.

“Sometimes people need a court to clarify their legal obligations before you can make progress,” said Swinomish Chairman Brian Cladoosby. “Hopefully, this decision will provide District 22 and others with the guidance they need to work with us to find a solution that works for both fish and farms.”

– *K. Neumeyer*

# Kids Learn Science, Culture in the Field

After a week of summer camp – splashing in creeks, hiking in the woods and peering into the past with animal skeletons and layers of rock – tribal youth walked away knowing more about their culture and the natural resources found in their territory.

The kids were part of the Elwha Science Education Project at the Olympic Park Institute (OPI) campus on Lake Crescent in June and July. Since 2005, tribal youth from Lower Elwha Klallam and Jamestown S’Klallam have come together every summer to learn about their culture and the earth sciences.

Tribal staff and OPI educators led the students on field trips in the Elwha Watershed and around Lake Crescent. Students used track plates to study wildlife populations, beach seined to study nearshore ecology, and learned to hunt traditionally for octopus at Freshwater Bay.

Tribal staff and parents provided cultural instruction for all the students to keep oral traditions alive. Cultural educators shared stories about the field sites and past ancestors, helped identify local plants, and taught the traditional uses of the plants as food, shelter and medicine. In the evening, tribal elders shared stories they were taught by their elders. During free time, students practiced beading, weaving and drum-making.

“Having a program like this for our youth is important because it is another venue where the kids learn about tribal culture,” said LaTrisha Suggs, Lower Elwha Klallam’s assistant



Blindfolded, Shannon Williams, 11, tries to figure out what animal’s skeleton she is holding during the Elwha Science Education Project summer camp. *Photo: T. Royal*

director for the river restoration project. “They also understand better how the Elwha River watershed works and how the river will change when the Elwha and Glines Canyon dams are removed.”

Funded by the National Science Foundation, the project is a partnership with Lower Elwha Klallam Tribe, Jamestown S’Klallam Tribe, Olympic Park Institute, Western Carolina University, Olympic National Park and local school districts.

– T. Royal

## Lower Elwha Klallam Tribe Replaces Culvert in Creek

Piling Creek can be easily missed with the blink of an eye; in fact, it often dries up entirely during the late summer. Much of the creek drains a large forested wetland perched on the floodplain of the Pysht River.

Although small and shallow, Piling Creek provides coho salmon with significant over-wintering refuge from the much larger Pysht River.

To help the juvenile coho that use Piling Creek during the winter as rearing areas, the Lower Elwha Klallam Tribe has improved access by removing a fish-blocking culvert and replacing it with a bridge this summer.

The creek, located on the Merrill & Ring Tree Farm, was crossed by a railroad wooden trestle until the 1950s. The trestle was replaced with a road and 24-inch-diameter culvert when the loggers switched from trains to trucks.

Culverts were cheaper and simpler to install than bridges. Over time, the old culvert degraded to the point it became a barrier to migrating fish.

Because of the creek’s strong potential to produce salmon, the tribe, in cooperation with Merrill & Ring, replaced the culvert with a 30-foot-long bridge.

“Small channels and wetlands located on the floodplain provide critical areas for salmon to rest and feed,” said Mike McHenry, the tribe’s habitat program manager.

“Salmon need this type of habitat, especially during the winter when the Pysht is running fast and high,” he said.

Replacing the culvert with a bridge allows the creek more room to move and helps contribute to the wetlands in upper Piling Creek. Wetlands are important for salmon because they provide refuge during storms and floods. – T. Royal

Lower Elwha Klallam tribal member Alan Charles guides a piece of the foundation that is part of a new bridge replacing a fish-blocking culvert. *Photo: Lower Elwha Klallam Tribe*



# Cruise Ship Sewage Threatens Shellfish Beds

Thousands of people come through Seattle on cruise ships bound for Alaska via the Strait of Juan de Fuca and Puget Sound every summer. They bring suitcases, cameras and a lot of raw sewage.

Western Washington's treaty tribes are concerned about where these cruise ships dump their raw or treated sewage between the Washington coast and Elliott Bay. Releasing raw sewage could lead to shellfish harvest closures, especially for geoduck.

Since the cruise industry in the Northwest has doubled from 3,000 passengers coming through Seattle in 1999 to 6,000 passengers in 2005, the industry is starting to address those concerns.

Current regulations allow the vessels to voluntarily dump raw sewage four miles off the Washington coast, before entering the Strait of Juan de Fuca and Puget Sound. The Clean Water Act also allows dumping in Puget Sound if current restrictions are met, such as if the sewage is broken down and mixed with bleach.

**'Tribes are encouraged by the cooperation shown by the cruise ship industry on the efforts being made to keep Puget Sound clean.'**

– David Fyfe,  
shellfish biologist,  
Northwest Indian Fisheries Commission

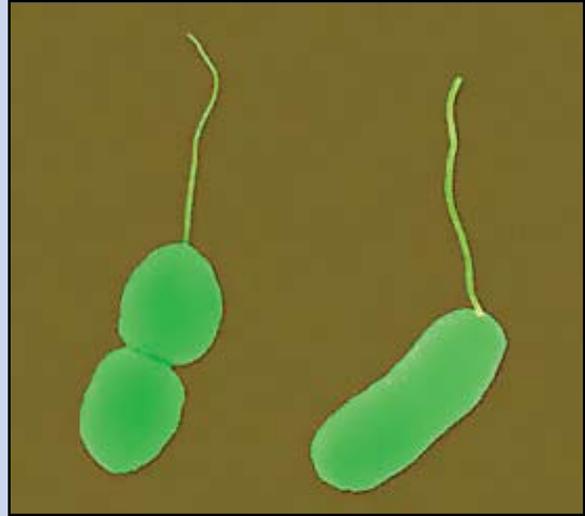
Recently, some ships have installed highly effective advanced treatment plants to kill fecal coliform bacteria and viruses that thrive in raw sewage. Ships with these new treatment plants are allowed to discharge the treated water directly into Puget Sound.

While this means less pollution entering the water, tribes are concerned about the potential for shellfish bed closures, which are regulated by the National Shellfish Sanitation Program.

"Shellfish are central to tribal culture," said David Fyfe, the Northwest Indian Fisheries Commission's shellfish biologist. "Tribes are encouraged by the cooperation shown by the cruise ship industry on the efforts being made to keep Puget Sound clean."

After working with the industry and state departments of Health and Ecology, the tribes' concerns have been largely addressed in the current memorandum of understanding (MOU) between Ecology, Port of Seattle and NorthWest CruiseShip Association.

Protective steps include prohibiting ships from discharging treated wastewater within a half-mile of commercial or tribal shellfish beds; installing real-time monitors to detect problems with wastewater disinfection systems; and immediately reporting wastewater disinfection problems to Washington Department of Health. Fyfe expects this issue to be proposed as a bill in the next state legislative session. – T. Royal



*Vibrio parahaemolyticus* is a bacteria that causes food poisoning-like symptoms. Source: Washington Department of Health

## Reducing *Vibrio* in Hood Canal Oysters

*Vibrio* bacteria have been troubling oysters harvested by several Hood Canal tribes this summer.

While there are several types of *Vibrio*, the strain *parahaemolyticus* has been causing most of the problems with Pacific oysters in Hood Canal. Tribes affected by the bacterial infestation include Jamestown S'Klallam, Port Gamble S'Klallam and Skokomish.

*Vibrio* causes food poisoning-like symptoms in humans. The naturally occurring bacteria grow quickly to dangerous levels during summer months when water temperatures reach 59 degrees or higher. *Vibrio* is destroyed when heated to 150 degrees during cooking.

"Most reports of *Vibrio*-related illnesses have been traced back to oysters harvested from Hood Canal because the oyster production is greatest in Hood Canal, but there's a potential for it anywhere there are oysters," said Tamara Gage, Port Gamble's shellfish management biologist.

For the past decade, the tribes have been working with the state Department of Health (DOH) to develop more stringent regulations to protect shellfish consumers. Steps include reducing the amount of time between the harvest and sale of oysters. Regulations typically allow a 24-hour window for harvesters to deliver oysters. But during the summer, when *Vibrio* levels can be higher, harvesters are required to deliver their catches to buyers within five hours or less.

"We have fine-tuned our management approach to ensure that fishermen are following the more complex set of regulations this year," said Randy Hatch, senior shellfish manager for Point No Point Treaty Council, a consortium of fisheries and wildlife biologists who support the Port Gamble and Jamestown S'Klallam tribes. "This year's isolated illnesses haven't been as numerous as those that occurred in 2006 and 2007, but we've also put more stringent conditions on harvesting, so that has helped a lot."

As temperatures drop this fall, the tribes will meet with DOH to determine if the regulations this year were effective. – T. Royal



Joan Miniken, Timber/Fish/Wildlife biologist (top), and Sayre Hodgson, salmon restoration biologist for the Nisqually Tribe, look for a water temperature monitor on Ohop Creek. Photo: E. O'Connell

# Salmon Don't Like it Hot

Water above 70 degrees can kill salmon. That's why the Nisqually Tribe is keeping a close watch on water temperatures throughout the Nisqually River watershed.

"Just like food or good spawning gravel, salmon need clean, cold water," said Jeanette Dorner, salmon recovery manager for the Nisqually Tribe. Tribal researchers download new data every summer from an array of more than four dozen thermistors – small devices used to record temperature changes over time.

Warm water can spawn diseases and carries little of the dissolved oxygen that salmon need to breathe. Because salmon are cold blooded, warm water increases their metabolic rate, forcing them to use energy needed for survival. If a returning adult salmon can't find enough cool water, it may

die before it has a chance to spawn.

By collecting data year-round, the tribe can see trends over time. "This kind of baseline monitoring is important because we're trying to see what is happening over the long term," Dorner said. "We can't tell what's really going on with only a few months of data."

Coho, steelhead and some chinook salmon over-winter in the Nisqually, meaning they spend at least an extra year in freshwater as juveniles. Both Nisqually River steelhead and chinook are listed as "threatened" under the federal Endangered Species Act.

"During the times of low summer flow, these salmon can die during their first year," Dorner said. "That makes it all the more important for us to know where that warm water is."

– E. O'Connell

## Deschutes Coho Still Hindered by 1990 Landslide

A nearly 20-year-old landslide is still hurting salmon, according to a recently completed analysis of sediment in the Deschutes River by the Squaxin Island Tribe.

"The sediment from that landslide is still working its way through the river system," said John Konovsky, environmental program manager for the Squaxin Island Tribe. "It has a relatively high proportion of minute dirt particles that continue to hinder coho reproduction."

In January 1990, a huge storm hit the Deschutes River, blocking an old culvert under a logging road. The resulting landslide sent tons of hillside sediment into Huckleberry Creek, a headwater tributary to the Deschutes.

"Huckleberry Creek used to be a major coho factory in the Deschutes watershed," Konovsky said. "That slide wiped out all of the coho rearing there and the population has never recovered."

Coho production in the 1980s was typically around 80,000-90,000 smolts per year, but in the early 1990s, it crashed.

Salmon need cool, oxygen-rich water in which to spawn. "High levels of fine sediment in spawning gravel smother freshly laid eggs," said Scott Steltzner, fisheries biologist for the tribe. New forest practice rules initiated since 1990 likely would have prevented the same type of catastrophic landslide that wiped out the upper Deschutes River coho and is still impacting watershed health.

"While floods, landslides and sediment are part of the natural cycle of a river, the 1990 landslide was an unnatural event," Konovsky said.

"We've been feeling the impact of this landslide for nearly 20 years," said Andy Whitener, natural resources director for the tribe. "For now, we'll have to make sure we do everything else we can to re-establish good spawning and rearing habitat."

– E. O'Connell

The impacts of the landslide in this 1990 photograph are still being felt by salmon in the Deschutes River. Photo: Squaxin Island Tribe



# Seeking Pocket Hiding Places



From left, Sarah Haque, Levi Keesecker and Scott Steltzner, biologists with the Squaxin Island Tribe, sort fish caught in a beach seine inside a pocket estuary on the north end of Harstine Island. *Photo: E. O'Connell*

The Squaxin Island Tribe is studying tiny pocket estuaries in deep South Sound to find out how important they are to endangered juvenile chinook salmon. The research is being funded by the state Salmon Recovery Funding Board.

“Anywhere a small stream flows into Puget Sound, juvenile chinook salmon can find refuge,” said Scott Steltzner, research biologist for the tribe.

For the next three years, tribal researchers will be collecting data on juvenile salmon usage in at least 10 pocket estuaries south of the Tacoma Narrows Bridge. “Dozens of creeks flow into deep South Sound, but we don’t know if many chinook use these estuaries,” Steltzner said.

Estuaries are key to the survival of juvenile salmon looking for food or refuge from predators. “Young salmon are at their most vulnerable when they’re migrating to the open ocean,” Steltzner said. “While we know that a lot of young salmon use big estuaries like the Nisqually, smaller estuaries probably provide an important link.”

The Squaxin Island Tribe’s project will dovetail with an ongoing study by the Nisqually Tribe, looking at fish usage around the Nisqually River estuary.

In previous studies, the Squaxin Island Tribe found chinook born as far away as the White River near Buckley swimming in Oakland Bay near Shelton. “Chinook use practically every piece of habitat available to them,” Steltzner said. “Even small, out-of-the-way places in Puget Sound are important.”

In addition to identifying which pocket estuaries are popular with salmon, the tribe is collecting basic habitat information. “We’ll be looking for estuaries that might be good candidates for restoration or protection,” Steltzner said.

The tribe fears the small estuaries could be damaged by development. “It’s easy to excuse the loss of one pocket estuary, but we need to learn how all of these places link together to support salmon,” said Andy Whitener, natural resources director for the tribe. – *E. O’Connell*

## *Johns Creek Petition Denied by Ecology*

The state Department of Ecology (DOE) recently declined to act on a petition from the Squaxin Island Tribe to stop all new water withdrawals, including permit-exempt wells, in the Johns Creek watershed near Shelton. The tribe is still considering its response to DOE’s denial.

“Summer flows on Johns Creek are already below the minimum required by state rules to protect salmon spawning,” said Andy Whitener, natural resources director for the tribe. “The responsible thing to do is for everyone to stop new water withdrawals and figure out what’s really going on with the creek, especially because the impact of more than 270 exempt wells drilled in the last 25 years has never been quantified.”

The tribe is filing the notice under a provision of state law that closes a watershed from future withdrawals if not enough information is available to justify those withdrawals. Development of a groundwater model as proposed by the tribe and the city of Shelton would have answered many of the questions surrounding Johns Creek, but funding for the model was denied by DOE.

Some winter rainfall seeps into the ground and provides both drinking water and summer stream flow for Johns Creek. Because wells draw water from the same aquifers that discharge into Johns Creek, when these wells are pumped, there is less water in nearby streams for fish.

“A groundwater model could have been used to identify where and when water can be taken from wells that would have little or no impact on streamflows,” said John Konovsky, environmental program manager for the Tribe.

Johns Creek is home to a small and fragile population of summer chum that is being harmed by increasingly low water levels.

“If summer flows were just at the minimum required, we would see 20 percent more spawning habitat available for summer chum salmon,” Konovsky said.

The approximately 13,000-acre watershed northeast of Shelton has been the center of recent economic and residential development efforts.

“We simply don’t know how much water is available for people to use near Johns Creek,” Whitener said. “You can’t just assume there is enough there for development to happen; you have to do the science first.”

“We’re watching Johns Creek wither away because water is a finite resource. We need to make sure we know what we’re doing.”

– *E. O’Connell*

## Lummi Nation: *Proactive Natural Resources Management Prevents Disaster*

*(Editor's Note: Tribal Voice is a new feature of NWIFC News, giving individual treaty Indian tribes in western Washington a place to share their views on important natural resources management issues.)*

When natural resources are proactively managed, disasters can be averted. It costs more to clean up a mess than it does to prevent one.

Reactive natural resources management results in crises such as oil spills, endangered species listings and fecal coliform contamination of shellfish beds.

High fecal coliform levels in Portage Bay on the Lummi Indian Reservation have been a problem for Lummi Nation shellfishers for many years. Between November 1996 and August 1998, 180 acres of productive Portage Bay shellfish beds were closed because of fecal coliform. Partial closures continued until May 2006.

The presence of fecal coliform bacteria indicates that water has been contaminated by human or animal waste. When levels are higher than established federal standards, it is not safe to harvest shellfish for commercial, ceremonial or subsistence purposes.

The state Department of Health completed a sanitary survey of Portage Bay after the initial closure in 1996. It found that farm animal waste originating in the Nooksack River watershed likely was the principal source of fecal coliform contamination.

In reaction to this closure, a coordinated response was initiated by the Lummi Nation, the U.S. Environmental Protection Agency, the Natural Resources Conservation Service, the state departments of Ecology and Health, the Whatcom Conservation District, Whatcom County and individual dairy farmers. This effort included changes in state and county laws, inspections of dairy farms in the Nooksack River watershed, increased



Merle Jefferson is the natural resources director for the Lummi Nation. *Photo: K. Neumeyer*

water quality monitoring, and technical and financial assistance to the dairy industry.

Because of these actions, the shellfish beds finally re-opened in May 2006. During the 10-year closure, more than \$8 million was provided to the dairy industry to stop the discharge of manure. Meanwhile, more than 200 Lummi shellfishers were unable to harvest from an area that produced about \$800,000 per year in revenue, costing our families about \$8 million over 10 years.

A proactive approach to dairy manure management would have prevented both the \$8 million loss to tribal members who were not at fault, and the need for the more than \$8 million given to the farming industry. Responsible dairy farmers manage their waste so that it does not harm others. But many do not manage their farms properly, resulting in the discharge of manure into waters that eventually flow into Portage Bay. This irresponsible, illegal approach comes at the expense of tribal members and others downstream.

Once the shellfish beds were re-opened in 2006, nearly all of the federal and state assistance with inspection, monitoring and technical advice evaporated. Now, history is starting to repeat itself. Manure spills have become more frequent and water quality in Portage Bay is starting to go bad again. Only a proactive approach can reverse this disturbing downward trend in water quality.