



NORTHWEST TREATY TRIBES

Protecting Natural Resources for Everyone

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Hood Canal Summer Chum Showing Recovery



by Lorraine Loomis
NWIFC Chair

Hood Canal/
Eastern Strait
of Juan de Fuca
summer chum is
the only threatened
salmon population

in western Washington showing clear signs of recovery.

It's thanks to a 20-year cooperative effort by state and tribal salmon co-managers, conservation groups, local governments and federal agencies that is balancing the key ingredients needed for recovery: harvest, hatcheries and habitat.

Summer chum were listed as threatened under the Endangered Species Act in 1999, along with Puget Sound chinook and Lake Ozette sockeye. Puget Sound steelhead joined the list in 2007.

The program's success comes from a core principle that salmon recovery must address all factors affecting natural production. For far too long the federal government's main response to protect ESA-listed salmon has been to cut harvest. Meanwhile, the primary threat to wild salmon and their recovery – ongoing loss and damage of their habitat – continues to be ignored.

Overharvest and poor ocean conditions, combined with degraded habitat, sparked the steep decline of summer chum that began in Hood Canal streams in the late '70s. By the early 1990s, fewer than a thousand summer chum were returning from a population that once numbered 70,000 or more.

The tribal and state co-managers responded with strong harvest management actions beginning in 1992. Fisheries impacting summer chum were reduced, relocated and delayed to protect the returning fish.

But it didn't stop there. Working with federal agencies and conservation groups, tribal and state salmon co-managers began hatchery supplementation programs to boost populations of summer chum.

A portion of the wild run returning to the Big Quilcene River was moved to a federal fish hatchery and spawned, with the offspring released to rebuild the remaining run. Four years later, about 10,000 adult summer chum returned to the river.

Since then, additional hatchery sup-

plementation efforts have led to summer chum becoming re-established to most of its historic range. To protect summer chum genetics, supplementation programs were limited to three generations, or 12 years. Some programs met their goals and ended earlier.

Habitat protection and restoration was the third key to bringing back summer chum. Projects such as dike removals, protecting and restoring instream habitat, planting streamside trees and removing invasive plants have all contributed to the effort's success. Nearly 700 acres of estuary and an equal amount of upland stream habitat have been improved to support the recovery effort.

More work is planned and ongoing in streams, estuaries and the nearshore throughout the area.

Balancing harvest, hatcheries and habitat is the key to salmon recovery. Equally as important is the need for monitoring and evaluation to apply lessons learned and improve effectiveness.

Cooperation is another essential ingredient. Only by working together can we hope to meet the challenges of salmon recovery. If we are ever going to recover Puget Sound chinook and steelhead, we will need to use the same approach we are using to save Hood Canal summer chum.

Despite the best efforts of fisheries managers to restore summer chum, they remain vulnerable to climate change and ongoing development. Because they arrive in streams to spawn during the late summer months, they are especially threatened by low flows like those we saw during this year's record-breaking drought.

Ongoing loss of habitat and a number of other factors still must be fully addressed before summer chum can be removed from the ESA list. There's still a ways to go, but at least we are on the right path.

How will we know when we have recovered summer chum? When they are once again abundant enough to support sustainable harvest. To the tribes, that is the true measure of salmon recovery and the commitment to fulfill the promises of the treaties we signed with the U.S. government.



Northwest Treaty Tribes

Protecting Natural Resources For Everyone

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On the cover: Skokomish fisherman Patrick LaClair Jr. works a beach seine in Hood Canal in late August, at the end of this year's chinook run.

NWIFC Introduces Northwest Treaty Tribes

Tribes. Treaty Rights. Natural Resources Management.

That's what the Northwest Indian Fisheries Commission is all about.

Recently, the NWIFC launched a new communications effort called *Northwest Treaty Tribes: Protecting Natural Resources for Everyone*. The effort is aimed at educating the public and others about the positive contributions of the tribes in natural resources management.

The name was chosen because it places the tribes and their treaty-reserved rights at the forefront of the effort. It also

highlights the fact that everything the tribes do to protect and restore the natural resources of our region also benefits everyone who lives here.

The NWIFC is not changing its name and will continue to function as it has since its creation by the tribes in 1974. The name, *Northwest Treaty Tribes: Protecting Natural Resources for Everyone*, applies only to the communication and outreach products of the NWIFC.

For example, you'll notice on the front cover that *NWIFC News* is now *Northwest Treaty Tribes*. You will still receive all of

the news and information you've come to expect from the NWIFC, but you will be getting it under the Northwest Treaty Tribes label. The NWIFC website at nwifc.org will continue to provide information about the organization and other content.

Stop by our website at nwtreatytribes.org or visit our [Facebook](#) page for more information. Please contact any member of NWIFC Communication Services if you have questions or comments.

– T. Meyer

Qwuloolt Estuary Flows Free for First Time in Century



K. Neumeyer

Michael Abrahamse, Tulalip field specialist, collects fish from a beach seine in the newly restored Qwuloolt Estuary.

After 20 years of planning and \$20 million invested by a number of partners, the Ebey Slough levee was breached in late August, restoring tidal flow to the 400-acre Qwuloolt Estuary in Snohomish County.

Named for the Lushootseed word for “marsh,” the Qwuloolt restoration was led by the Tulalip Tribes and is one of the largest in Puget Sound.

Ebey Slough was diked and drained 100 years ago to create farmland, cutting off fish access to valuable salt marsh habitat. Efforts at watershed management began in the late 1980s, with the formation of the Puget Sound Water Quality Authority under then-Gov. Booth Gardner.

Tulalip tribal member Terry Williams, who is now the tribes' natural resources commissioner, was part of that process.

“While creating the watershed program, we realized that at the time, it was legal to build dikes in the estuary, but it was illegal to use funding to tear them down,” he said. “We set out in that first plan to change that and we did.”

The Water Quality Authority evolved into the Puget Sound Part-

nership, setting a goal of restoring Puget Sound by 2020.

So far, the tribes and Snohomish County have accomplished their 10-year goal, Williams said.

“Originally in the Puget Sound Partnership, we said we'd get about 1,100 or 1,200 acres restored in the estuary and we're now at over 1,500,” he said.

Before the levee was breached on Aug. 28, juvenile fish could out-migrate through tide gates, but adult fish were blocked from returning to the estuary.

Tulalip natural resources staff is monitoring changes to water quality and fish use of the habitat before and after the breach. A week after tidal flow was restored, the team found both a juvenile and an adult coho salmon in the estuary.

“This habitat is so crucial to migrating and juvenile salmon, providing food and refuge for those fish,” said Kurt Nelson, manager of the Qwuloolt Estuary project for Tulalip. “It's the intent of this project to increase production and quantity of those salmon that are extremely important to the tribe for cultural and economic purposes.”

– K. Neumeyer

Watch a time lapse of the breach: nwt.co/qwuloolt

Reconnecting Barnaby Reach

A major salmon habitat restoration project is planned for the Barnaby Reach of the Skagit River, with planners considering the impacts to the surrounding community.

The Skagit River System Cooperative (SRSC), the natural resources extension of the Swinomish and Sauk-Suiattle tribes, is managing the project on land owned by the state, Seattle City Light and The Nature Conservancy. Four alternatives are proposed, but nearby landowners are concerned about the potential flooding impacts caused by the alternative that would most benefit salmon.

“This project is likely to be one of the largest floodplain restorations in Puget Sound,” said Devin Smith, SRSC project manager.

Barnaby Reach extends from Illabot Creek downstream to the Sauk River, near Rockport. The project area includes 300 acres of aquatic habitat, where 11 barriers block fish access to nearly 80 acres, plus a mile of tributary streams. The work would restore floodplain access, improve fish and wildlife habitat, reduce flood and erosion risks, and provide recreational opportunities.

All of the proposed alternatives will remove barriers to fish passage, including culverts as well as dams and fishways that were installed for a now-defunct hatchery.



Skagit River System Cooperative

An aerial view of Barnaby Reach shows the sloughs and ponds that could be reconnected to the Skagit River.

The most ambitious alternative would install engineered logjams in the main channel and fully restore the Skagit River’s connection to Barnaby Slough, Harrison Pond and Lucas Slough.

“This linkage would greatly improve fish habitat benefits; the estimated increase for chinook salmon is about 90,000 more juvenile fish each year,” Smith said. “This estimate increases to more than 170,000 new juvenile fish every year within 10 to 15 years as more natural floodplain functions are restored.”

The increase in juvenile salmon usage with this alternative is significantly higher than the other three alternatives, which would likely increase

chinook numbers by just 10,000 to 13,000 juvenile fish per year.

Landowners in the Martin Road area have expressed concern about flooding. Modeling has not shown increased flooding in this area for any of the alternatives, although much of the surrounding area already is at risk of flooding under existing conditions.

“The project sponsors are taking landowner concerns seriously and are committed to working with them to develop a project they can support,” Smith said.

For more information, including a fact sheet describing the project status, visit barnabystudy.wordpress.com.

– K. Neumeyer

GENERATIONS

In this 1947 photo, Swinomish fish cooks Louisa Billy, left, and Minnie (Buck) Dan prepare salmon for a large tribal gathering in the Swinomish Village across the channel from La Conner. Also pictured is Alice Dan, right. The first accounts of large community meals date back to 1923 when Swinomish began hosting Treaty Day gatherings.



Ernest Bertelson, Courtesy of University of Washington, Swinomish Tribal Archive

Skokomish Estuary Restoration Nears Completion

With just a few more earth-moving projects left, the Skokomish Tribe is nearing the end of the restoration of its 1,000-acre estuary in southern Hood Canal.

The tribe is in the third and final phase of restoring the estuary that was once dominated by dikes and agricultural activities for more than 70 years.

The dike system, built in the early 1940s, prevented the delta from receiving a natural tidal flow, hindered plant growth and eliminated important juvenile salmon rearing habitat.

“This summer and next, we are reconnecting the historic hydrology between the forested wetlands and the salt marsh,” said Alex Gouley, the tribe’s habitat program manager. “Right now, there isn’t enough flow and hydrology for it to happen naturally, so we’re kind of helping it along.”

In 2015, contractors filled in man-made ditches and recreated historic tidal channels for salmon to use when making their way into fresh water. Box culverts were installed under the access road to Tacoma Power’s transmission towers that are stationed on the estuary.

In 2016, small fish-blocking culverts will be replaced with bridges on Skokomish Flats Road, the primary access road to the estuary.

After that, it’ll be left up to nature.

“After this phase, the estuary will be pretty much restored to nearly like it was before it was diked,” Gouley said. “Then it will just be letting nature take over fully.”

As construction wraps up, the tribe’s habitat and salmon biologists will continue monitoring the changes that have been taking place since 2007 when the first dikes were removed. Biologists have been counting the number of salmon returning to tidal channels and observing birds utilizing the resurgence of native plants.



T. Royal
Lisa Belleveau, Skokomish Tribe habitat biologist, left, and Jason Lewis, habitat technician, count and measure vegetation in the Skokomish estuary.

“We have observed an overall accumulation of sediment of a little more than an inch across the estuary,” said Lisa Belleveau, the tribe’s habitat biologist. “This helps build elevation that creates an environment capable of supporting more salt marsh vegetation.” – *T. Royal*

Weather Elements Contribute to Hood Canal Fish Kill



Seth Book, Skokomish Tribe

A small sampling of the typically deep-water critters found on Hood Canal shores in August.

The past year’s bizarre weather patterns have been severely affecting the marine life in Hood Canal.

“It’s a complex issue with many factors,” said Seth Book, the Skokomish Tribe’s environmental biologist. “Basically, Hood Canal is highly productive but sensitive due to limited circulation and excessive nutrient levels.”

For starters, the tribe witnessed several fish kills this summer. The most significant was at the end of August, when the southern canal’s dissolved oxygen (DO) levels reached record lows.

For 10 years, researchers have been collecting DO data from buoys in Hood Canal. They have been watching the DO levels drop all summer and anticipating an event like this, Book said.

The first signs of dead fish, crab and shrimp were seen in late July by tribal fishermen.

In late August, ratfish, crab and eelpouts lined the shoreline in southern Hood Canal, lethargic and gasping for air.

Tribal divers found shrimp normally seen at 250 feet trying to breathe at 15 feet.

Low dissolved oxygen is typically caused by excessive growth of algae from increased nitrogen levels in the water. When the algae die and decompose, they consume dissolved oxygen in the process.

In the late summer, low DO is found 100 feet below the surface. Southern winds help the layer of water upwell, flushing the canal and bringing higher levels of DO from the bottom.

However, if the middle of the water column has low DO and is pushed up to the surface too quickly, marine life can’t take refuge near the surface and can asphyxiate, causing a die-off.

“We need the ocean waters coming into Hood Canal to help flush the system but it is also brings nutrients into the system that are fueling algal blooms,” Book said. “We need the flushing to renew water, but not too abruptly because it may cause the fish kills.” – *T. Royal*

Tribes Respond to Drought in Western Washington

Fisheries managers closely monitored stream flow, water temperatures and fish passage during one of the state's worst droughts.

Late August rains brought sighs of relief from tribal fisheries managers, cooling stream temperatures and allowing fish to move upriver to spawn.

"It frequently gets hot and dry in September and October, but this unusual freshet of rain in August was just what we needed," said Frank Geyer, Quileute Natural Resources deputy director. The tribe, along with other tribes and the state, implemented conservative fisheries this summer because of the drought and forecast for lower returns.

"It's nice that as we move into fall, we can go with our reduced fishing schedule, but not have to talk about any other restrictions for now," Geyer said.

By July, with water temperatures above normal ranges, fish disease had spread within crowded ponds in rivers. Temperatures around 70 degrees begin to affect fish behavior and may kill them, and pathogens such as *Ichthyophthirius multifiliis* (ich) and *columnaris* (gill rot) thrive in warm water.

Hatchery conditions

The U.S. Fish and Wildlife's Makah National Fish Hatchery chose to euthanize about 80,000 young coho to prevent the spread of *furunculosis*. The bacterial disease had spread rapidly in the 70-degree Tsooyess River in August and antibiotics didn't help.

Quileute fishermen encountered sockeye in the Quillayute River with heavy fungus, which is often a sign of ich or gill rot.

"Sockeye are the canary in the coal mine for salmon," Geyer said. "They need cold water and if it's too hot for them, it's not good news for the other salmon species as we move into early fall and a couple more months of this weather pattern."

Several hatcheries, including Makah and Lummi's Skookum Creek Hatchery, released juveniles earlier than usual to beat declining flows.

Fish passage

In late July, Quileute fisheries staff, state personnel, a state Department



Above: Dean Jackson, Quileute fisheries technician, removes fish from a pool cut off from the main flow of Morganroth Creek. This summer's prolonged drought left young salmon and other fish species orphaned more than usual. Right: Quileute tribal fisheries personnel Jack Davis, left, and Dustin Larkin walk a long, dry stretch of Morganroth Creek while looking for pools of stranded fish.



D. Preston (2)



“It frequently gets hot and dry in September and October, but this unusual freshet of rain in August was just what we needed.”

– Frank Geyer, Quileute Natural Resources deputy director



T. Royal (2)

The Jamestown S’Klallam Tribe, Washington Department of Fish and Wildlife and Washington Conservation Corps crews spent three days in mid-August building emergency diversion dams in the Dungeness River. Watch a video to see hundreds of pink salmon hanging out in the Dungeness while the group improves the water flow for them at nwtt.coldamsforsalmon.

of Corrections chain gang and North Olympic Salmon Coalition volunteers placed sandbags in the Sol Duc River to improve chinook passage by diverting the river’s low flow to the Sol Duc Hatchery pump house.

On the Dungeness River in mid-August, the Jamestown S’Klallam Tribe installed several diversion dams throughout the river to divert waterflow to the deepest part of the channel to help chinook and pink salmon make their way upstream.

“The diversion dams worked great and we observed fish using them immediately after construction,” said Aaron Brooks, the tribe’s fisheries management biologist. The portable dams were removed in anticipation of the heavy rains in late August.

“The rain was a much needed blessing as it really helped move fish throughout the river,” Brooks said.

LOW FLOW

On the South Fork Skokomish River in late July, a half-mile of the river ran dry with intermittent pools of water lining the riverbed’s edge.

“The Skokomish River measured at 75 cubic feet per second (cfs), but a lot of the water is going underground, under the gravel bars,” said Skokomish biologist Matt Kowalski.

Surveys will be performed regularly on the South Fork through the rest of the low water season to determine the extent,

locations and longevity of dry streambed conditions.

On the Elwha River, flows were considered a critical low at 200 cfs until the rains came in August. As a result, the city of Port Angeles is maintaining water rationing that limits residents to watering outdoors every other day.

“In early September, things are looking pretty good on the river,” said Matt Beirne, the tribe’s environmental quality biologist. “But there is a chance that flows could drop down to that level again if we resume the drought pattern through the fall.”

– D. Preston, K. Neumeyer & T. Royal

Warm Water, Low Flow Hinders Fish Passage

Salmon fishing in Tulalip Bay closed between late July and early September because a thermal barrier kept many salmon from entering the bay, and low flows prevented others from swimming upriver.

Normally, chinook salmon return via the Skykomish River to the state's Wallace River Hatchery, where they are spawned for the Tulalip Tribes and state's joint hatchery program. Fry released from Tulalip's Bernie "Kai-Kai" Gobin Hatchery provide fishing opportunities for both tribal and sport fishermen in the bay, but the Wallace River releases are essential to keep the run going.

This year, along with other rivers in the region, the Skykomish set records for the lowest flows ever recorded.

Fish couldn't make it back to the Wallace River Hatchery in the shallow water. They held in the lower pools of the Skykomish and Snohomish mainstems, said Mike Crewson, Tulalip salmon enhancement biologist.

"They don't want to come into Tulalip Bay even, because it's too warm," he said at the time.

To collect broodstock, the tribe opened its fish ladder in Tulalip Bay in July. A week later, slightly lower temperatures and a small amount of rain brought about 90 chinook through the ladder, still far too few to yield enough eggs for the hatchery program.

The co-managers have an arrangement where each year they spawn about 3,500 adults and share 4.8 million eggs. The state gets the first 1 million eggs to rear and release into the Wallace River, and Tulalip gets the next 800,000 to release from its hatchery. They split the remaining eggs.

A series of rainstorms in late August improved this year's egg take by bringing more chinook into the bay and upriver.

"We got bailed out at the very last second, considering how low the river was," Crewson said. "The trend is alarming. The drought is extending later and later, where it might extend into chinook spawning season."

By early September, Tulalip's hatchery had about 1,400 fish, but the Wallace River Hatchery still had only 600 fish. About a third were viable female



K. Neumeyer

Andy Williams, Tulalip hatchery technician, collects adult chinook from a fish ladder in Tulalip Bay. The hatchery opened the ladder after high temperatures and low flow prevented chinook from making it upriver to the Wallace River Hatchery.

spawners, yielding 900,000 eggs. With 1,000 chinook still in the river, hatchery managers hoped some would return voluntarily. Otherwise, they planned to collect more hatchery-origin fish in the river.

"Even with the best-case scenario, I don't think we'll get our egg take for both hatcheries," Crewson said. "We're probably going to have to give eggs to the Wallace River Hatchery." – K. Neumeyer

"We got bailed out at the very last second, considering how low the river was. The trend is alarming. The drought is extending later and later, where it might extend into chinook spawning season."

– Mike Crewson, Tulalip Tribes salmon enhancement biologist



E. O'Connell



T. Meyer

Left: Jed Moore, biologist for the Nisqually Tribe, prepares a temperature monitor for installation in the lower Nisqually River. Above: A pink salmon makes its way up the White River, a tributary to the Puyallup River.

Tribes Keep Close Eye on Stream Temperatures

By closely monitoring river temperatures during a hot summer, South Sound tribes were able to make quick decisions to protect fish health.

The Puyallup Tribe of Indians more than doubled the number of temperature monitors in its watershed to 13 to track a feared thermal barrier to fish returning from the ocean.

If a stream's water gets too warm, salmon have to expend more energy to survive, which can often lead to starvation. Diseases that kill salmon are also more virulent and spread easily in warm water.

"If the water in the lower river is too warm, they'll just turn around and go somewhere else," said Russ Ladley, resources protection manager for the tribe. "Even if some fish do try to head upstream, they might die before they spawn because of the warm water."

Water temperatures on the White River, a tributary to the Puyallup River, peaked at 80 degrees in early July before dropping.

In addition to high temperatures, flows in the lower Puyallup have been less than

half the norm.

"This river depends on snowpack for much of its spring flow," Ladley said. "There wasn't enough snow for normal flows so far this year."

Tens of thousands of coho and chinook returned to the watershed during a scorching late summer. At the same time, hundreds of thousands of pink salmon were forecast to return to the river.

Tribal staff walk the streams each fall, tracking the migration and spawning patterns of these runs.

"In addition to the temperature gauges, we should get a pretty complete picture of whatever is going on out there," Ladley said.

The tribe has already seen the impact of warmer waters this summer. The tribe pulled their smolt trap out of the mainstem Puyallup River about a month early, because there were too few fish to count.

"We're assuming that between flow and temperature, juvenile salmon decided to just leave the river earlier than they would have otherwise," Ladley said.

The Nisqually Tribe has six temperature

monitors in its watershed. Tribal staff regularly download data from the monitors to give tribal and state co-managers a clear picture of temperature conditions.

The tribe recently shut down a weir to allow free migration of salmon through warmer sections of the river. The tribe has been operating the weir since 2011 to separate hatchery-produced chinook salmon from naturally spawning fish migrating upriver.

"The long-term goal of creating a self-sustaining population of chinook has to take a backseat to the deteriorating conditions we're seeing on the river," said David Troutt, the Nisqually natural resources manager. "We can only hope that these changes we're making can prevent a salmon disaster on the Nisqually this summer."

The tribe also worked with the city of Centralia, which shut down hydroelectric operations on the river. The city operates a diversion dam, so shutting down power production this summer allowed more water to reach a vital stretch of river for chinook. – E. O'Connell



D. Preston (2)

Above: Hoh tribal youth Kandace Hernandez eats huckleberries from bushes near the Hoh River. Below: Kandace and her father, Ruben Hernandez, watch Jay Powell, an authority on coastal tribal languages, show the *Pala pala* game that teaches the Hoh word for sword fern.



Youth Unplug to Reconnect

A weeklong summer adventure taught 27 Hoh tribal youth to unplug from electronics and connect with the Hoh River.

“You turn off the cell phones, the tablets and the music, and get back to the basics,” said Lorraine Cress, Hoh tribal youth support coordinator. “Love, talk and play. It’s all about regaining balance.”

While the tribal youth live near the mouth of the Hoh River, few connect with the 56-mile river like their ancestors did.

Hoh tribal members, natural resources staff and Olympic Coast National Marine Sanctuary staff created a summer program for kids 5 to 18 years old. Campers hiked three miles into Olympic National Park where old-growth forests still look like they did when Hoh tribal members lived in seasonal camps along the river.

Hoh tribal fisheries technician Ruben Hernandez attended the camp with his 6-year-old daughter Kandace.

“Kandace loved it and so did I,” he said. “I think the important thing for the kids was that it was fun. We weren’t preaching, just kind of letting them see and enjoy this place that is so much a part of who we are.”

While hiking several miles up the Hoh River trail to gather huckleberries, native plants expert Elizabeth Campbell, a Spokane tribal member, taught the children what was edible and how to identify other common plants and trees. They learned the Hoh words for counting and plant names using games from Jay Powell, a specialist in coastal tribal languages.

“*Pala pala pala pala pala pala pala,*” said Kandace Hernandez as she touched as many of the fronds of a sword fern as she could in one breath, just as her ancestors did for centuries. Others tried to beat her number and won’t ever forget the word for sword fern.

The group rafted and camped on the Hoh River for two days, finishing where the river meets the Pacific Ocean. There, tribal members prepared salmon smoked on a stick and salad from the tribe’s community garden served with a dressing made with huckleberries gathered during the week.

“The whole thing was really gratifying,” said Susanah Spock, a biologist for the tribe who helped plan the camp. “It was an amazing coming together of a lot of folks to make it happen.”

Nearly 20 adults, including staff from Olympic Coast National Marine Sanctuary and Olympic National Park, participated in the week, and the Hoh tribal community came together at the mouth of river for the dinner.

“That sense of community is really healing,” Cress said. “It was really emotional, and we said that it’s a beginning, not an end.”

The tribe has funding from the Bureau of Indian Affairs Rights Protection and Implementation Climate Change Funds for a second year and will begin planning soon for 2016. – D. Preston



Lummi Nation member Richard Solomon speaks to youth who participated in the inaugural Coast Salish Mini University called Spirit of the *Sxwo'le*.

Honoring Traditions at Historical Fishing Site

For the first time in generations, members of the Lummi Nation gathered on the shores of Henry Island, a traditional fishing site known in the tribal language as *Lhelhinqelh*.

The privately owned property had been off-limits until one of the landowners, Sarah Hart, collaborated with tribal members to hold a naming ceremony in July and make the site available to them in the future.

“Our villages were along the migratory paths of the salmon,” said Al Scott Johnnie, Lummi cultural administrative policy assistant. “We are the people of the reef net.”

A reef net – *sxwo'le* in the tribal language – is a traditional fishing method in which a net is suspended between two canoes.

The ceremony was the culminating event of a weeklong Coast Salish Mini-University for tribal youth, called Spirit of the *Sxwo'le*.

“This process was to help the youth understand the holistic

connection,” said organizer Shirley Williams, Lummi tribal member. “They are the Keepers of the Tradition and Protectors of the Circle of Life.”

About 20 youth spent the week camping on nearby San Juan Island, where they learned about their culture from tribal elders and other community leaders.

“We’re learning how to live off the land and to be grateful for the resources that we have,” said Rebecca Kinley, who works with the youth through Lummi Behavioral Health. “We’ve done that through a series of activities, through nature walks, getting on the canoe, eating our traditional foods from the water, (and) learning our language because that’s the medicine that’s going to keep our culture alive.”

“Our culture is amazing,” said camper Makayla Briones. “The reef net is amazing. The Salmon People are worth saving.”

Justin Finkbonner, skipper

of the Lummi Youth Canoe Family, taught the teens traditional songs that they sang at the naming ceremony on the last day of the camp.

“My favorite thing this week was probably getting to know where I come from and being out in nature,” said teen Nickolasa Revey.

The youth canoed to *Lhelhinqelh* from San Juan Island early in the morning. Later, tribal fishing boats arrived at Open Bay and the canoes were used to ferry guests to shore.

“I’m thankful for the protocol that I witnessed,” Williams said. “For the past year, I have been asking that the Spirit of the *Sxwo'le* and our children be surrounded by all that is positive as we return to the ancestral lands of our people and that we would join together in peace and unity once again.”

– K. Neumeyer

Watch a video of the event at nwtt.co/sxwole

Lummi Nation members Troy Olsen, in blue-and-red blanket, and Dana Wilson, in blue and white, receive ancestral names during a ceremony on *Lhelhinqelh*.

K. Neumeyer (2)



Logjams Provide Salmon Refuge, Add Complexity

Scott Rockwell, Stillaguamish forest and fish biologist, observes an 8-foot-deep shady pool created by an engineered logjam on a new stretch of the North Fork Stillaguamish River.



K. Neumeyer

Deep pools can be the difference between life and death for salmon during record-breaking summer

Temperatures on the Stillaguamish River reached record highs, while flows reached record lows this past summer, which can be fatal for juvenile salmon migrating to sea and adult salmon returning to spawn.

Salmon need cool, shaded pools to rest and hide from predators, but many river systems in the region lack the woody material needed to create those pools. As co-managers of the salmon resource, treaty tribes in western

Washington have worked in partnerships to install hundreds of engineered logjams throughout the region.

The Stillaguamish Tribe is in the second phase of a project to construct seven logjams in the North Fork Stillaguamish River and nearby side channels. The wood structures are being built on a former tree farm the tribe purchased about five years ago.

“It’s a really valuable piece of property in terms of conservation,” said Scott Rockwell, the

tribe’s forest and fish biologist. “It’s unsuitable for other types of land use.”

The North Fork in particular is devoid of habitat complexity and vulnerable both to flooding and the recent drought. Logjams mimic natural conditions, not only creating pools, but also improving overall complexity and recruiting cold groundwater.

“We started doing engineered logjams back in the 1990s, based on research done on the Hoh and Queets rivers

within the national park,” said Pat Stevenson, Stillaguamish environmental manager. “They studied and monitored what natural logjams looked like in a quasi-pristine environment. The structures we build are based on the natural setting.”

All five species of Pacific salmon spawn in the North Fork, as do steelhead and bull trout. The area was designated a priority for restoration in the 2005 Chinook Salmon Recovery Plan. – K. Neumeyer

Tribal Hatchery Keeps Spawning Salmon Cool



Stillaguamish fisheries technician Kate Konoski, left, and biologist Jason Griffith sort adult chinook salmon collected for broodstock on the North Fork of the Stillaguamish River.

This year, the broodstocking effort is even more essential to protecting the salmon run, because elevated river temperatures and low flows made it difficult for salmon to return to their spawning grounds. The chinook salmon collected by the tribe were held in cool water at the tribal hatchery until it was time to be spawned.

K. Neumeyer

Tumble Bags Smooth Oysters, Boost Quality



T. Royal

Suquamish shellfish biologist Paul Williams secures mesh bags of oysters to an anchored structure in Dyes Inlet as part of a new oyster tumble bag method.

The Suquamish Tribe is experimenting with a tumble bag system that grows high-quality Pacific oysters.

“We’re trying to grow single oysters as a pilot project initiated by Suquamish Seafoods,” said Viviane Barry, the tribe’s shellfish program manager. “The tribe’s seafood company has an interest in utilizing tribal beaches to cultivate clams and oysters and perhaps other shellfish as well.”

Staff from both Suquamish Seafoods and the tribe’s fisheries department, plus local volunteers, installed anchor systems for securing 500 plastic mesh bags that each hold approximately 200 oysters that are about 1 inch long.

The bags are split up between two beaches, one behind Suquamish Seafoods’ processing plant, and one in Dyes Inlet.

The tribe is trying two methods. The bags at Suquamish Seafoods are resting on the beach while the bags in Dyes Inlet are suspended in air. Both systems will allow the bags to float with the tides.

The oysters tumble in the bags to erode the sharp lip of the shell, creating a deeper cup and high-end oyster, Barry said.

Coast Seafoods provided the seed, which was put into the tribe’s floating upwelling shellfish system at the Brownsville Marina. The seeds grew there for up to eight weeks until they were transferred to tidelands in late August.

The oysters will be monitored for fouling and growth during the next 12-18 months, after which they’ll be removed from the bags.

“Several growers in the Northwest have adopted this tumble bag method and Suquamish wants to see how it would work on its beaches,” Barry said.

“In today’s economy where our fish runs have been decimated, focusing on shellfish is a big part of our plan to help support not only the economic arm of the tribe but help tribal members with another source of income,” said Suquamish Seafoods general manager Tony Forsman. – T. Royal

International Geoduck Tour

A group of Chinese delegates observe geoduck being processed at the Suquamish Seafoods plant during a tour in mid-August. The delegates also observed a tribal geoduck harvest and shared a dinner and cultural exchange featuring a performance by the tribe’s singers and dancers group.



T. Royal



E. O'Connell

Celebrating Return of the First Salmon

Joe Peters, Squaxin Island fisheries management biologist, cooks salmon at the tribe's First Salmon Ceremony.

According to tribal tradition, the first salmon caught each season must be revered so he will return to the sea, gather his family and return to the rivers. If the salmon is not treated with proper reverence, his people will not return.

Many tribes in western Washington hold first salmon ceremonies and blessings of the fleet at the beginning of the year's fishing season.

Restoration Leads to Record Run of Coho

A combination of dam removal and aggressive habitat restoration has led to record runs of juvenile coho salmon in Goldsborough Creek.

This year's run of 113,000 juveniles continues the strong trend of an increasing number of coho in the Goldsborough watershed. The previous record was 61,000 coho.

Nearly 15 years ago the U.S. Army Corps of Engineers removed a dam on Goldsborough, opening more than 30 miles of near-intact salmon habitat. Since then, the Squaxin Island Tribe has worked with community partners to improve the habitat through restoration projects throughout the watershed.

"The lesson of Goldsborough Creek is pretty basic: If you give salmon habitat, they're going to succeed," said Andy Whitener, the tribe's natural resources director.

A couple of years ago, the tribe worked on a project with the South Puget Sound Salmon Enhancement Group, Simpson Lumber, the Green Diamond Resource Co. and Miles Sand and Gravel. The partners added wood structures to the stream to give both juvenile and adult salmon places to feed and hide.

A year earlier, the tribe and the en-

hancement group replaced undersized culverts to open nearly a mile of spawning and rearing habitat that had not seen salmon in more than 100 years.

The tribe has operated smolt traps on the creek since the dam removal to count outgoing salmon migrants.

"By using the trap every year, we're getting a great picture of the benefits salmon get from good habitat," said Daniel Kuntz,

fisheries biologist for the tribe.

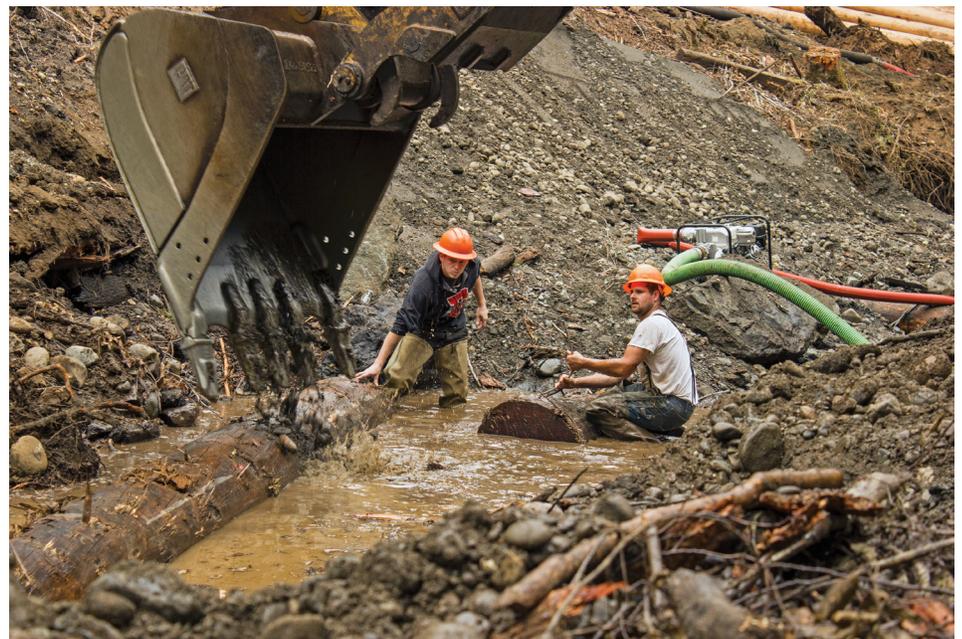
The tribe and the state Department of Fish and Wildlife also conduct yearly adult spawning surveys on Goldsborough Creek above the former dam site.

"We get a good look at these salmon at both ends of their life cycle – as they leave as juveniles and as they're returning as spawning adults," Kuntz said.

– E. O'Connell

Logjams constructed along Goldsborough Creek, in addition to several other habitat projects, have led to historic runs of juvenile coho.

E. O'Connell





Above: A look skyward shows gaps between alder trees left by Quinault Indian Nation (QIN) tree-fallers to support growth of Sitka spruce. The effort aims to restore river function and protect salmon habitat. Right: Michael Mazzacavall, R2 Resource Consultants biologist, measures growth of a spruce sapling as part of long-term plot monitoring.



D. Preston (2)

Sitka Spruce Planted to Improve Sockeye Habitat

The Quinault Indian Nation is restoring Sitka spruce and native vegetation to the upper Quinault River valley floodplain to help improve productivity of blueback (sockeye) salmon.

The Quinault Division of Natural Resources (QDNR) and its contractor, R2 Resource Consultants, have completed the first of many floodplain forest treatments.

“Most of the original Sitka spruce forest in the river valley was removed by the 1950s to establish homesteads or was clear-cut back when they didn’t replant,” said Kevin Fetherston of R2 Resource Consultants.

The project treated about 70 acres, thinning red alder to allow existing spruce to grow more quickly and to provide gaps in the canopy for new tree

growth.

Crews planted 12,000 spruce seedlings at about 170 trees per acre, similar to the densities in naturally developing forests of the Hoh and Queets river bottoms.

Planting Sitka spruce will encourage the return of natural ecological functions of the floodplain, especially in forested side channels.

Sitka spruce can grow to 300 feet tall and live to 700-800 years old. When these giants fall into the river, they provide the skeleton for future floodplains to develop by collecting more trees, rock and silt until islands form, stabilizing river channels and providing habitat that fish need to grow and reproduce.

The project also included clearing non-native Himalayan blackberry from the

project area.

“The non-native blackberry formed dense, impenetrable thickets that had outcompeted native trees and shrubs,” said Caroline Martorano, QDNR invasive species specialist.

The blackberry was removed by a five-man crew armed with machetes and power brush cutters who cut down and mulched the non-native plant. The same locations will be examined and retreated if necessary, then planted with native grasses, shrubs and spruce seedlings in spring 2016.

The team also is implementing an experimental treatment to address reed canary grass encroaching side-channel habitats.

The project is mostly on state aquatic lands adjacent to Olympic National Park, but also includes some private and

QIN-owned land.

“We chose the area for treatment because the red alder stands and developing floodplain provided conditions suitable for thinning operations and spruce seedling planting,” said Bill Armstrong, QDNR habitat management scientist.

Monitoring will include measuring the amount of light in the forest gaps and rate of tree growth to assess the results of the thinning and overall rehabilitation approach.

The project is being used as a demonstration to show what the Nation and its restoration partners want to accomplish on a larger scale not only in the upper Quinault River floodplain, but in managed floodplains of other coastal river systems as well.

– D. Preston

QUILEUTE TRIBE



Above: Quileute tribal member Keith Penn ices fresh hatchery coho salmon from the state's Sol Duc Fish Hatchery. Right: Chris Rockwell, WDFW hatchery employee, left, heaves a coho up to Quileute tribal staff while Quileute fisheries technician Jack Davis and WDFW employee Scott Meecham wait to grab more fish to send to firefighters and survivors in eastern Washington.



D. Preston (2)

Fighting Fire with Fish

Wildfire victims and firefighters in eastern Washington were gifted with salmon by the Quileute Tribe and a state hatchery.

Surplus coho salmon from the Washington Department of Fish and Wildlife's Sol Duc Fish Hatchery are usually shared with the Quileute Tribe and a local food bank, among others. This year, fish were sent to feed those affected by the Okanogan Complex fire and North Star fire on the Confederated Tribes of the Colville Reservation. More than 120 homes have burned in the Okanogan complex fire, and the North Star fire spread to more than 200,000 acres.

"My parents (Paul and Brenda Turner) are volunteering in the Tonasket Distribution Center that helps displaced families and

firefighters with food and supplies," said Jacob Turner, a fisheries biologist for the Quileute Tribe. Quileute fisheries personnel gathered and filleted about 40 coho that were smoked by tribal member Russell Woodruff and other volunteers.

"It's for a good cause," said Woodruff. "I'm glad we can help out the people over there a little who care for the land. I wish we could do more – there are a lot of people displaced there."

Smoked fish is good food for firefighters who often ask for beef jerky as a portable protein.

Tribal staff obtained another 40 fresh coho before transporting both the fresh and smoked salmon to Tonasket. A dinner for both firefighters and survivors featured the fresh fish.

– D. Preston