



Northwest Indian Fisheries Commission

NWIFC News

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Fix White River Dam

By Billy Frank Jr.
NWIFC Chairman

A crumbling 103-year-old fish-blocking diversion dam and inadequate fish passage system on the White River near Buckley need to be replaced because they are leading to injury and death for hundreds of threatened salmon, steelhead and bull trout, slowing salmon recovery efforts in the river system.



It's common for some adult salmon to display a few cuts, scrapes and scars by the time they complete their ocean migration and return to spawn. That can take two to six years, depending on the species.

But more and more fish are now being found at the foot of the diversion dam with gaping wounds and other injuries caused by exposed wooden boards, steel reinforcement bars and other parts of the deteriorating structure. Many of those fish later die from their injuries.

At the same time, an explosive revival of pink salmon has overwhelmed the inadequate trap-and-haul fish passage system operated by the U.S. Army Corps of Engineers. At two years, pink salmon have the shortest life cycle of all salmon and are abundant in the Puget Sound region. Pink salmon returns to the White River have shot up in the past decade from tens of thousands to close to a million.

That's led to massive crowding of returning adult spring chinook, steelhead and migrating bull trout at the foot of the diversion dam where salmon continually try to leap over the structure – injuring themselves in the process – in their effort to move upstream and spawn. All three species are listed as threatened under the Endangered Species Act.

The diversion dam, constructed in 1910, sends water from the river to Lake Tapps. The dam prevents adult salmon from reaching the Mud Mountain Dam farther upstream, which is also impassable to salmon. Instead, fish are collected in a 73-year-old trap just below the diversion dam, then trucked upriver and released above Mud Mountain Dam.

There's been a lot of talk but no action to fix the fish passage problem in the river.

Back in 2007, the National Marine Fisheries Service (NMFS) issued a biological opinion under the Endangered Species Act requiring the Corps to upgrade the fish trap. So far, the Corps has ignored the order, claiming that it doesn't have the money. Meanwhile, NMFS has turned a blind eye to the Corps' documented illegal killing of ESA-listed salmon.

In 1986, only a handful of spring chinook returned to the White River, but today those returns number in the thousands because of the cooperative efforts of the Muckleshoot and Puyallup tribes, state government and others.

The Corps and NMFS need to step up to the plate and do their jobs. When they don't, what they are really saying is that salmon, treaty rights, and years of effort and investment by so many of us here in Puget Sound don't really matter.

NWIFC News

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On the cover: Isaac Ellingson, Quinault Indian Nation fisherman, helps lay a purse seine on the deck of the *Catherine Kate* during a sardine fishery in the Pacific Ocean. See Page 5 for the story. D. Preston

Salmon Suffering from Dilapidated Dam

White River Salmon Incurring More Injuries in Recent Years from Unmaintained Structure

Salmon are returning to the White River with gaping wounds and cuts because a diversion dam is not being maintained.

“It isn’t uncommon to see a few injuries – gashes and scars – in fish as they make their way back, just because of normal wear and tear,” said Russ Ladley, resource protection manager for the Puyallup Tribe of Indians. “But in the last few years, we’re seeing more major injuries that are likely shortening the lives of these fish because the dam is breaking down.”

The river constantly wears down the wooden dam near Buckley, leaving boards and steel rebar jutting out.

Migrating fish are blocked from moving up the White River by the dam. The fish are collected from a trap at the dam and trucked above it and another impassible dam higher in the watershed.

Several species returning to the White River – chinook, steelhead and bull trout – are listed under the federal Endangered Species Act.

The dam was originally built in 1910. In 1996, the dam changed



Puyallup Tribe of Indians (2)

Salmon returning to an adult trap on the White River are being wounded by a degrading dam.

hands from Puget Sound Energy to the Cascade Water Alliance. The long-term goal of the alliance is to use the diversion to supply water to suburban King County cities. In the meantime, the degradation of the dam has gotten worse.

“If the dam isn’t regularly repaired, it can get in pretty bad shape,” Ladley said. “Salmon typ-

ically move across a wooden curtain below the dam, getting beat up along the way, before finding their way to the trap.”

“These kinds of injuries aren’t natural,” Ladley said. “These will often lead to disease and sometimes mortality before the fish can actually spawn.”

Because the massive return of pinks every other year overwhelms the inadequate fish trap, all salmon species have a hard time making it past the dam.

The risk of a massive die-off increases daily as the pink salmon – along with coho and chinook salmon – crowd below the dam. Crowded conditions may deplete the oxygen in the water, or drain the fish of spawning energy before they can be moved.

“Salmon only have so much energy. If they run out of time and energy, then they’ll die before they spawn,” Ladley said. “We’re risking years of hard work to recover these runs because we can’t keep a dam in good repair.”

– E. O’Connell



The wooden diversion dam on the White River near Buckley is not being maintained and is injuring salmon as they come back to the river to spawn.

Reef Net Fishery for Pink Salmon

For the first time in generations, the Lummi Nation held a reef net fishery at Cherry Point.

“It feels good to say that as of yesterday, we, the Lummi Nation have been reef netting,” said Lummi Chairman Tim Ballew at a tribal event Aug. 28. “To know that tomorrow we will reef net and the days after we will too.”

The traditional reef net is suspended between two canoes, with grasses woven into ropes along the bottom to simulate a natural reef. Tribal fishermen watch for the salmon to swim close to the surface, then lift the net.

“A *sxwole* (reef net) is a gift from our creator, therefore an inherent right,” said Al Scott Johnnie, tribal cultural administrative policy assistant. “This was a way of life for our people, and the method was also to allow our sockeye to go up into the river so they could replenish, because they were our extended family.”

Known in the tribal language as *Xwe'chi'eXen*, Cherry Point was a Lummi tribal village and traditional reef net site for hundreds of years. After the Lummi Nation signed the Point Elliott Treaty in 1855, tribal fishermen continued to reef net until about 1894, when non-Indian fish traps out-competed them, according to the 1974 *U.S. v. Washington* ruling that reaffirmed tribal treaty fishing rights.

A 1934 ban on fish traps in

Puget Sound gave tribal fishermen renewed access to their traditional sites, but the 1939 opening of a cannery brought more competition from non-Indian fishermen who were able to reef net in more profitable locations.

In the *U.S. v. Washington* ruling, Judge George Boldt noted that there were 43 reef nets operating off Lummi Island at the time; none of them by tribal fishermen.

“Members of the Lummi Tribe are entitled to and shall have, as a matter of *right*, the opportunity to fish with reef nets in such areas,” Boldt wrote. “(W)hile non-treaty fishermen when licensed by the State to fish in reef net areas have the *privilege* of fishing in those areas ‘in common with’ Lummi Tribal members, they do not have the *right* to do so.”

North of Bellingham, Cherry Point is the site of the proposed Gateway Pacific Terminal, a coal export facility that would be the largest in North America if built. Lummi tribal leaders strongly oppose the coal terminal because of the damage it would do to natural resources and the traditional grounds.

The pink salmon reef net fishery celebrated the tribe’s traditional use of the area.

“We want our young people to remember some of the teachings of our ancestors and this way of the reef net,” Johnnie said. — *K. Neumeyer*

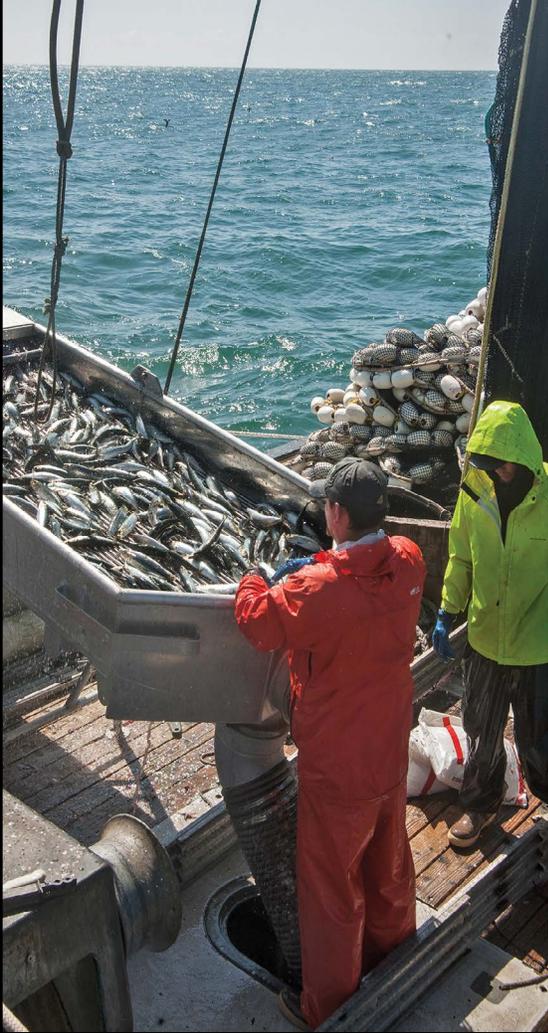


K. Neumeyer



T. Meyer

Top: An aerial photo shows Lummi tribal fishermen using a reef net positioned near a natural eelgrass reef off Cherry Point. Bottom: Lummi tribal fishermen lift a reef net suspended between two canoes.



D. Preston (2)

Above: Seagulls fly over a purse seine full of sardines as it is pulled close to the *Catherine Kate*. Left: Once the net is close to the side, a vacuum pump is lowered into the mass of fish, pumping them on deck where Frankie Pickernell prepares to sort through the haul.

Quinault Fisherman Adds Sardines to Net

The Pixar film *Finding Nemo* may be fiction, but Quinault Indian Nation (QIN) fisherman Tim Haataia can verify that one scene is very real.

To free a net full of fish, *Nemo's* father exhorts the mass to swim downward, forcing fishermen to open the net to prevent sinking.

"They can totally sink your boat," Haataia said. "You have to be watching all the time – if it's too many fish or if they start sinking the cork line, it means they're diving and you have to be ready to let them go."

The fisherman is in his second year of fishing for sardines, but the fish are much more dispersed this year than last. A spotter plane helps fishermen locate the skittish schools of fish, with each fisherman paying a portion of the pilot's cost.

While motoring his boat, the *Catherine Kate*, out of the Westport marina in the pre-dawn dark, Haataia sighed in frustration

seeing the low fog.

"It makes it impossible for the plane to help spot sardines," he said. Without the plane's help, fuel is wasted and net sets can be futile.

Last year, the fish were available a short distance off Westport. This year, Haataia motored for hours to find sardines in the area where he can fish.

"The non-tribal fleet has been finding fish south of Westport near the Columbia River mouth, but that's not in our fishing area," he said.

Like most fishermen, Haataia found that having his 58-foot-boat idle for any period longer than a couple of weeks made it more of a struggle to make ends meet, so he took up the challenge of the new fishery because it allowed him more fishing days.

Sardines are caught using a purse seine deployed by a skiff to encircle the school of fish. The net is hauled in, closing the "purse" and trapping the fish. Fish are vac-

uumed from the net and deposited into the boat's hold.

The sardines he is catching are 8 to 9 inches long and most are sold directly overseas to foreign markets.

The West Coast Pacific sardine fishery provided nutritious food to the military beginning in World War I, peaking in the late 1930s. But between a huge fishing effort and changing ocean conditions, the stock crashed for a number of years. The sardine population only returned to a harvestable size after biologists and fisheries managers better understood the sardine life cycle.

Changing ocean conditions combined with competition from an international sardine fleet that does not follow fishing limits like those in the United States and Canada mean that sardine populations are likely in decline temporarily, said Quinault Indian Nation fisheries biologist Alan Sarich.

– D. Preston

Logs Contribute to Salmon Habitat

By putting logs in Goldsborough Creek, the Squaxin Island Tribe and the South Puget Sound Salmon Enhancement Group will create salmon habitat and protect a logging railroad.

The tribe and the enhancement group are working with Simpson Lumber and the Green Diamond Resource Co. to build new structures to benefit both salmon and job seekers.

“Right now the creek doesn’t have enough of the things that salmon need, like pools and cover, to really survive,” said Scott Steltzner, salmon biologist for the tribe. “The logs in the stream will help provide a nice large pool and help salmon as they migrate out and then when they come back as adults.”

The partners also will protect a railroad that runs next to the creek by building a log wall. Because the wall will incorporate elements of a natural logjam, it will be more fish friendly than a traditional rock retaining wall.

“It has been harder and harder for Simpson Lumber to maintain the railroad because the creek has been eroding the bank,” said Brian Combs, project manager for the South Puget Sound Salmon Enhancement Group. “The crib wall is a salmon-safe option to make sure the railroad doesn’t wash away.”

The work on the creek builds on the effort that began more than a decade ago when a dam was removed lower in the watershed.

“After the dam came down, salmon were able to access the upper 25 miles of the Goldsborough Creek watershed,” Steltzner



E. O'Connell

Construction of a new logjam and cribwall on Goldsborough Creek will help protect a railroad and restore salmon populations.

said. “By enhancing the habitat up here, we should boost salmon productivity even more.”

Last summer, the tribe and the enhancement group replaced two undersized culverts that blocked a tributary to Goldsborough, opening nearly a mile of new spawning and rearing habitat.

Coho especially will benefit from the restoration project, since they spend more time in fresh water than other salmon species and depend more on freshwater habitat. – E. O'Connell

Determining Cause of Declining Coho Salmon

The Squaxin Island Tribe is taking a close look at Mill Creek to find out why coho salmon numbers have declined so significantly in what appears to be a fairly intact system.

“This is a very comprehensive study of the freshwater habitat in the creek,” said Sarah Zaniewski, habitat biologist for the tribe. In addition to conducting habitat surveys throughout the lower Mill Creek watershed, the tribe is surveying juvenile salmon populations and collecting water temperature data.

Like most South Sound streams, Mill Creek coho production dropped off about 20 years ago.

“While there was a certain level of recovery in most of the streams to a new lower, sustainable level, production in Mill seems to have fallen off the cliff,” Zaniewski said. “No one seems to know why. There’s no obvious change in the past 20 years that could easily explain why we don’t find more adult spawners here.”

The tribal surveys will focus on the low-



E. O'Connell

Michael West, a Squaxin Island Tribe technician, surveys salmon habitat in Mill Creek.

er 8 miles of the creek, which flows out of Isabella Lake before entering Puget Sound.

“We know juvenile salmon use the upper portion of the creek’s watershed, which

includes two tributaries that flow into the lake,” Zaniewski said. “What we don’t know is why the overall watershed production is low.” – E. O'Connell

Bringing Back Bull Kelp

After watching bull kelp vanish from the shorelines around Kitsap County for 20 years, the Suquamish Tribe is working with the Puget Sound Restoration Fund (PSRF) to explore methods to reintroduce the aquatic vegetation.

Bull kelp serves as a physical barrier that reduces nearshore erosion by absorbing wave energy. Bull kelp forests also are excellent habitat for juvenile salmon, which use the kelp beds as refuge from predators and foraging during their migration to the ocean.

“The reasons for the kelp decline are uncertain, but habitat loss along shorelines, pollution, nutrient discharges, increased sedimentation, and boat wake and propeller damage may interfere in the plant’s complex life history cycle,” said Brian Allen, a PSRF ecologist.

“It’s well documented that salmon and steelhead require healthy habitat to thrive,” said Paul Dorn, the tribe’s senior salmon research biologist. “The challenge is that salmon use very diverse habitats. Most of our salmon recovery projects are focused in the watersheds and estuaries. In this case, we’re trying to look at and understand what’s happening to these underwater kelp forests that are generally out of view from most people. On the reservation, the local historic kelp beds are, effectively, in a complete state of clear cut.”

Since 2010, there have been multiple efforts to learn more about bull kelp.

“Kelp grows so quickly on a microscopic level underwater that it’s difficult to document, even in the lab,” Allen said. “We want to know about where and how critical changes happen in the bull kelp’s life history. Every time we did a project or surveys, we learned a ton.”

Allen and Dorn have been studying bull kelp beds off Bainbridge Island, Elliott Bay, and adjacent to the tribe’s reservation at Jefferson Head. The scientists also partnered with the Port Gamble S’Klallam Tribe to study kelp beds near Point Julia in 2011.

In 2013, PSRF coordinated with the Washington Department of Natural Resource’s (DNR) acoustic research team to document kelp bed growth over large areas, including Bainbridge Island and Port Madison. The results from DNR’s sonar survey provide an accurate estimate of aquatic vegetation including plant density, cover, height and total area, Dorn said.

There also were several experimental approaches in 2010 and 2011 to seed plots in Port Madison, Point Julia, and near Restoration Point on Bainbridge Island, where kelp was introduced at different life stages. The projects produced limited bull kelp growth that ended up being consumed by kelp crab before the plants could reach the surface.

“While the results were disappointing, we feel the work was still a success, because we learned about methods that worked and didn’t work,” Allen said. “We found where the crab grazed on the plants and where kelp beds were affected by boat wakes and propellers, but also found good substrate for kelp.”

– T. Royal



Brian Allen of the Puget Sound Restoration Fund displays a bull kelp plant.

T. Royal

Surprise Results in Nearshore Work

The Port Gamble S’Klallam Tribe is finding more juvenile salmon in small bays than other nearshore environments, including large estuaries in Hood Canal and Admiralty Inlet.

“We’re not seeing fish near the mouths of big river systems like we expected, such as the Duckabush or Dosewallips rivers,” said Hans Daubenberger, the tribe’s habitat biologist. “Fish appear to be quickly leaving the marine waters around our large river estuaries in search of smaller and calmer areas with shallow water to find food.”

Since 2011, the tribe has been using beach seines, surface trawls and a hydroacoustic “torpedo” to determine where and how juvenile fish are using nearshore environments. The beach seining and surface trawls show what types of fish are in the nearshore; the hydroacoustic “torpedo” shows the abundance of fish.

The largest densities of fish were found in Port Gamble Bay, Pleasant Harbor, Jackson Cove, Hood Head, Port Ludlow, Kilisut Harbor, and Quilcene and Dabob bays. Surprisingly, they were not in waters adjacent to the Duckabush and Dosewallips river systems.

“While we know juvenile salmon typically use estuaries for refuge and feeding, the data we’ve collected indicates that the small embayments we survey are consistently more productive in terms of nutrients in the water column,” Daubenberger said. – T. Royal

Port Gamble S’Klallam habitat biologist Hans Daubenberger prepares hydroacoustic equipment for launch in Port Gamble Bay.



T. Royal

Paddle to Quinault Honors Those Who Served

D. Preston (3)



The Quinault Indian Nation welcomed 89 canoes to the beaches of Point Grenville in August during the Paddle to Quinault, with the theme “Honoring Our Warriors.”

Veterans of all services were honored throughout the weeklong potlatch and as part of the welcome at the beach. Point Grenville was also renamed Haynisisoos Point, in honor of QIN tribal elder Phillip Martin. *Haynisisoos* was the name Martin received as a boy in Queets, meaning “thundering elk.”

QIN tribal elder Emmett Oliver also was honored for his pivotal role in reviving the canoe journeys 24 years ago when the Paddle to Seattle took place as part of the state’s centennial celebration.

Top: Pullers from the Snoqualmie Indian Tribe head out to sea. Far right: Lummi tribal member Lawrence “Happy” Solomon smiles as he waits to ask permission to come ashore with Raven Antiste (left) and Tony Washington. Right, Miss Quinault, Erica Kramer, dances during the final day of the potlatch.



Old Yellow Cedar Used for Paddles

The canoe paddle is both a symbol and a tool for tribal canoe journeys. While its general shape might stay the same, handles and decorations vary widely from tribe to tribe and puller to puller.

When a monstrous yellow cedar blew down on the reservation last year, the Quinault Indian Nation (QIN) considered how best to share it.

“It was 13 feet in diameter at the bottom,” said Guy Capoeman, QIN Paddle to Quinault coordinator. “It was believed to be the largest yellow cedar in North America.”

Yellow cedar is preferred for paddles because of its strength. The slow-growing cedar is increasingly

difficult to find because it is not commonly planted as a commercial tree.

“This was something we wanted to share with our guests,” Capoeman said. “Large paddles were made for pulling, and smaller ones were made for dancers.”

They also were left undecorated, so recipients could make the paddles their own.

QIN also made and gave away 10 canoes for ocean and river journeys. The canoes were given to tribes or canoe families that were important in the resurrection of the annual tribal canoe journeys, or provided guidance to new pullers and families. – D. Preston



D. Preston

Guy Capoeman, coordinator of Paddle to Quinault, makes preparations for the Tribal Canoe Journey, alongside a stack of yellow cedar paddles to be gifted to honored guests.

Decades-Long Restoration Nearly Finished

Completion is in sight for the Qwulooft project, one of the largest estuary restorations in the country.

Restoring tidal flow to the 400-acre estuary is a partnership among the Tulalip Tribes, U.S. Army Corps of Engineers and the city of Marysville, as well as other local, state and federal agencies. Planning for the \$11 million project dates back 20 years and involves funding from multiple sources.

“Sometimes it takes a long time to get things done,” said Tulalip Tribes board member Glen Gobin. “None of this could have happened without everyone working together. Most of us will not see the benefits in our lifetime, but our children and grandchildren will see it.”

The estuary was drained and diked for farming in the early 1900s, keeping juvenile salmon from accessing the habitat they need to feed and mature before out-migrating to Puget Sound. The eventual goal of the restoration is to recover salmon populations enough to sustain a tribal fishery.

“Our ancestors built a strong and thriving economy from the salmon trade over many thousands of years,” said Tulalip Chairman Mel Sheldon. “Today, the wild runs are in



K. Neumeyer

Visitors to the Qwulooft restoration project walk along a dike that will be breached to restore tidal flow to a 400-acre estuary.

a state of crisis. Our partnership with the Corps is a vitally important step in the effort to reconnect Qwulooft to the natural processes of the estuary and will eventually provide critical rearing habitat for salmon.”

In the final phases, a new setback levee will be constructed as the existing levee is breached and lowered in places. Thousands

of feet of riparian and wetland berm will be constructed.

“Since 2007, we’ve constructed 9,000 feet of stream channel,” said Kurt Nelson, project manager for Tulalip. “We’re hopeful that with constructing the levee this year, and the breach in 2014, the project will be largely completed.” – K. Neumeyer

Native Plants Filling in Skokomish Estuary

Kneeling in a thicket of vegetation in the Skokomish estuary, Shannon Kirby combs her hands through the tall green grasses in front of her, calling out codes that identify them by size, type and

abundance.

The habitat biologist for the Skokomish Tribe is studying the native freshwater and saltwater vegetation that is taking over the Skokomish estuary, which was diked and dredged for 100 years until recently.

“The response in vegetation is very promising, as is the diversity that’s out here,” Kirby said. “Estuarine plants are a huge source of food for animals, and double as a water filtration system, neutralizing pollutants and providing nutrients for plant growth. We’re right on target for where an estuary should be.”

The tribe is finding pickleweed, salt grass, sedges, rushes, sea arrow grass and Puget Sound gumweed.

Since 2010, every August, when vegetation is in full bloom, tribal staff visit 75 sites throughout the 1,000-acre estuary, looking at plant types, sizes, growth and soil composition.

These observations coincide with the tribe’s insect studies, which include conducting lavages on juvenile salmon to determine the insects they are eating.

“The quality of salmon habitat is determined by the plants that are out here and the insect food source,” Kirby said.

The tribe has been restoring the estuary at the mouth of the Skokomish River since 2007, through dike and culvert removal, large woody debris installation and native plant revegetation. Through three phases so far, the tribe has restored up to 1,000 acres of habitat for salmon and wildlife. – T. Royal



T. Royal

Skokomish Tribe habitat biologist Shannon Kirby takes note of vegetation growing in the Skokomish estuary.

Landslides Raise Concerns about Spawning Fish



K. Neumeyer

Nooksack Tribe water quality supervisor Tom Cline takes a water sample from the Nooksack River.

A series of landslides in May and June along the Middle Fork Nooksack River just below the Deming Glacier on Mount Baker has fisheries managers concerned about the effects of increased sediment loading on chinook salmon and steelhead.

“The slide came at a very bad time for incubating steelhead, which were probably most of the way through spawning and had eggs in the gravel,” said Ned Currence, biologist for the Nooksack Indian Tribe. “We were essentially at the peak of spring chinook upstream migration.”

The landslides sent clay-rich debris flows downriver, carrying boulders more than 10 feet wide and knocking down trees. Surviving trees were coated with mud, according to the Mount Baker Volcano Research Center, which monitors Cascades volcanoes.

The Nooksack Indian Tribe has monitored sediment discharge for several years in the Nooksack River watershed, focusing on areas that could influence water quality and the reproductive success of threatened spring chinook.

After the debris flows along the Middle Fork Nooksack River last spring, turbidity at the Nugent’s Corner Bridge on the

mainstem exceeded the maximum levels the tribe’s automated turbidity meter could record.

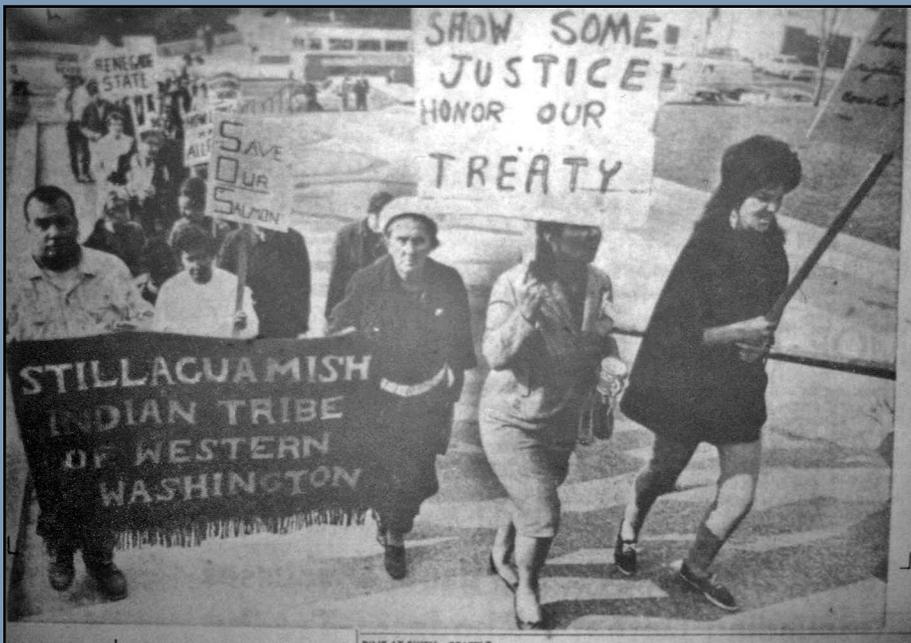
“The turbidity and stream discharge measurements allow us to estimate the amount of sediment being transported in the water,” said Jean Snyder, water resources specialist for the tribe.

Water quality supervisor Tom Cline and technician Richard Auguston download the data every two weeks from suspended sediment samplers on the South Fork and an automatic pumping sampler on the mainstem. They also collect and test physical samples of suspended sediment.

“The next step will be determining what it means for fish,” Snyder said.

By August, the turbidity on the mainstem had returned to levels typical for the season.

“The North Fork and Middle Fork are always turbid this time of year because they’re glacially fed,” Cline said. “The South Fork is less turbid because it is fed by snowmelt, but it also suffers from low flow and high temperatures in August and September.” – K. Neumeyer



Stillaguamish Tribe

Generations

Stillaguamish tribal leader Esther Ross, center, participates in a march urging the federal government to honor its treaties with Indian tribes.

Ross was instrumental in gaining federal recognition for the Stillaguamish Tribe and for getting the tribe named to the federal *U.S. v. Washington* court case, which affirmed tribal treaty fishing rights.

Kite Camera Captures Elwha River Changes

Lower Elwha Klallam Tribe youth gathered data for the U.S. Geological Survey (USGS) by flying a kite over the Elwha River this summer.

As part of a science-based summer camp focusing on the Elwha River restoration project, the kite collected data about the ever-changing Lake Aldwell delta. The red kite had a small digital camera attached to the fly line, set up to take pic-

tures of the ground every three seconds.

The aerial photos document the rapidly changing delta of the Elwha River during removal of the Elwha and Glines Canyon dams, said KC Nattinger, field science educator with NatureBridge, a Lake Crescent-based science education camp.

“It’s a great project for the kids since it allows them to participate in a science experiment in an area that they are culturally tied to,” Nattinger said.

In addition to flying kites, the kids took water quality samples, explored old tree stumps and driftwood, and learned about the tribe’s cultural ties to the river.

Klallam language teacher Harmony Arakawa talked about rediscovery of the tribe’s creation site. It had been under the Lake Aldwell reservoir for a century until the Elwha Dam was removed last year, draining the reservoir.

Arakawa explained that tribal members would go on spirit walks, first bathing themselves in the river and Olympic Hot Springs, then walking to the creation site seeking a vision.

Science has confirmed the stories older generations have



T. Royal (2)

Tribal youth fly a kite equipped with a camera to take aerial photos of the Aldwell delta to monitor changes to the river.

passed down, explaining changes to the river.

“These stories aren’t just stories,” said Wendy Sampson, another Klallam language teacher. “We’re seeing evidence of the

stories that our elders have told us. You kids are part of history. You were some of the last kids whose picture was taken in front of the Elwha Dam before it came down.” – T. Royal



Campers Irene Peters and Karrin Francis examine an elk antler during the NatureBridge science camp.

Salmon Camp

Jessica Moore of Northwest Trek shows two high school students from the Nisqually community how to track wildlife populations.

This summer, a group of young Nisqually tribal members got a close look at natural resources management through a cooperative project between the tribe’s Stream Stewards program and youth program. The two-week “Salmon Camp” introduced tribal high school students to skills they need to pursue careers in natural resources management. Classroom sessions dealt with treaty fishing rights and fisheries management. The students also received hands-on experience in plant identification, salmon habitat surveys and water quality sampling.



E. O’Connell



T. Royal

Skokomish shellfish technician William Williams drops a spat collector into the water near the Skokomish estuary.

Sampling Oyster Spat in South Hood Canal

Skokomish Tribe shellfish technician William Williams leans over the side of a boat and drops a cement block bristling with Pacific oyster shells into the water near the Skokomish tidelands.

The tribe is distributing several of these blocks throughout southern Hood Canal to attract oyster spat, or larvae, to learn more about oyster reproduction in the area.

Pacific oysters spawn by broadcasting reproductive cells, some of which result in fertilized eggs and later mature to larvae. The larvae float with the tides and currents until they settle on a hard surface such as oyster shells, known as “cultch.”

“We want to try to get an idea of what kind of spat resource we have locally,” said Chris Eardley, Skokomish Tribe’s shellfish biologist. “The advantage of southern Hood Canal is that the water is warmer than the northern end of the canal, which helps with natural oyster reproduction too, although it may take several summers of monitoring to paint a picture.”

Eardley tried several spat collection efforts this year, including setting out bags of clean shells on tidelands as well as sowing shells by hand. Eardley checked shell that was spread in May and found a healthy amount of spat growth. – T. Royal

Red Dye Reveals Wastewater’s Path

The Nisqually Indian Tribe recently helped the state Department of Health (DOH) figure out where shellfish in southern Puget Sound are safe to harvest.

The project partners – which also included other state and federal agencies – tracked red dye that had been injected into treated wastewater at Joint Base Lewis-McChord’s plant near Dupont.

“The dye tells us how long it takes wastewater from the plant to dilute and where exactly it went,” said David Troutt, the tribe’s natural resources director.

The study is part of a larger project being led by DOH to see if water pollution can be cleaned up along an important stretch of shoreline.

“Sewer outfalls have meant a large piece of deep South Sound has been closed to shellfish harvest for decades,” Troutt said. Some outfalls have recently been rerouted or are being upgraded to reduce pollution heading into Puget Sound.

“With a decrease in pollution, we could see shellfish harvest open back up,” Troutt said.

As part of the larger project, the tribe also conducted a shellfish census. The tribe surveyed both intertidal and sub-tidal species between the mouth of the Nisqually River and the Tacoma Narrows.

“Because the area was closed for so long, no one bothered to look at how much shellfish was available for harvest,” Troutt said.

Where the tribe found poor shellfish habitat, the likely reason was miles of bulkheads built decades ago to protect a railroad. The bulkhead prevents the natural erosion of nearby bluffs that contribute to good shellfish beaches.

The possible cleanup of the area would be a boost to the tribe’s treaty-reserved right to harvest shellfish.

“Anything that prevents us from harvesting natural resources that would be available threatens our treaty rights,” said Georgiana Kautz, natural resources manager for the tribe. “Harvesting shellfish is important to us both economically and culturally. We hope to find that this area is clean now and we can go back.”

– E. O’Connell



E. O’Connell

Nisqually Tribe shellfish biologist Margaret Homerding deploys a device to record dye levels in the water column near Steilacoom.

Tribes, State Gather Strait Data on Geoduck

Due to its popularity with harvesters and shellfish lovers, scientists are learning more about geoduck clams found in the Strait of Juan de Fuca.

During the past two years, the Jamestown S'Klallam Tribe, Lower Elwha Klallam Tribe and Washington Department of Fish and Wildlife (WDFW) have collected age and genetic data from the bivalves found in the strait.

"Geoduck is currently managed as a single Puget Sound stock," said Kelly Toy, Jamestown S'Klallam's shellfish management biologist. "But there may be regional differences that exist between geoducks in the strait and other regions within Puget Sound. Gathering age and genetic data specific to geoducks will help us determine if there are regional differences and develop a model that would help improve the sustainability of the geoduck resource."

"When modeling this fishery, we use age data to determine the harvest rate," said Bob Sizemore, a WDFW shellfish research scientist. "The age information is much

better in the Central and South Puget Sound regions. To improve the age structure information in the strait, we are taking a sample of about 600 geoducks along Dungeness Spit. We also are using this opportunity to take tissue samples from the same animals for genetic analysis."

Strait geoduck data was last collected in the 1970s and 1980s. Scientists started gathering data again in 2012, collecting tissue and shell samples.

To determine the age, they shuck the shell completely, cutting the shells at the hinge, also called the umbo. Scientists then count the rings found in the cross-section of shell to determine its age.

The shells are categorized by age class, so scientists can determine what years were good for geoduck. Large numbers suggest good survival for that year. The information also helps fisheries managers make better data-based decisions about population structure and harvest management strategies. — *T. Royal*



T. Royal

WDFW shellfish biologist Hank Carson cuts the siphon off a geoduck for a study in partnership with the Jamestown S'Klallam Tribe.



K. Neumeier

Getting Steamed

Swinomish tribal member Willie Montoya prepares shellfish for the eighth annual community clam bake.

The Swinomish planning department hosts the event every year at Lone Tree Point on the tribe's reservation. Clams, mussels and corn on the cob were buried and steamed in a beach pit for the August event.



F. Wilshusen

Hood Canal summer chum were listed as threatened under the Endangered Species Act in 1999. A recent surge in the population shows that recovery efforts are working.

Summer Chum on Path to Recovery

After more than a decade focusing on salmon harvest management, hatchery management, and habitat restoration, there is a good chance that threatened Hood Canal/Strait of Juan de Fuca summer chum could be removed from the federal Endangered Species Act list.

“The population status is improving and on trajectory for recovery,” said Thom Johnson, Point No Point Treaty Council environmental program manager, who announced some of these findings at the 2013 Hood Canal summer chum salmon recovery symposium. “Our recovery goals haven’t been met yet, but the outlook is much brighter compared to 14 years ago when summer chum were listed.”

Following the listing in 1999, the Point No Point Treaty tribes (Port Gamble S’Klallam, Jamestown S’Klallam, Lower Elwha Klallam and Skokomish) and federal, state, county and local agencies developed and implemented a recovery plan that was adopted in 2007. While the plan included new

hatchery and harvest management actions implemented by the tribal and state co-managers beginning in 1992, habitat restoration and protection were identified as critical for salmon survival and recovery, Johnson said.

“Collectively, the recovery actions have contributed to increased population abundance and diversity, and have improved spatial distribution,” Johnson said. “In rivers where more comprehensive habitat restoration or protection has taken place, the summer chum seem to be self-sustaining and are closer to the recovery goals. Where little habitat work has been done, summer chum are not doing as well. We need to be strategic and keep doing what we’re doing, and more, because it works.”

The Hood Canal Coordinating Council (HCCC), the regional organization leading the recovery effort, is developing a 10-year work plan to guide future efforts. For more information on the summer chum recovery work, visit hccc.wa.gov.

— T. Royal

Captive Broodstock Reach Spawning Age

More than 500 mature chinook salmon raised in captivity could produce about 1 million eggs at the Lummi Nation’s Skookum Creek Hatchery this year.

Of those, more than 600,000 juveniles are expected to be released into the river next spring.

The fish are part of a captive broodstock program to preserve threatened South Fork Nooksack River chinook. The multi-agency effort involves Lummi, the Nooksack Tribe, the state Department of Fish and Wildlife (WDFW) and the National Oceanic and Atmospheric Administration (NOAA).

In 2007, the partners began collecting juvenile chinook in the South Fork Nooksack River to raise to spawning age. After being genetically tested, the fish identified as South Fork chinook were raised either at the WDFW Kendall Creek Hatchery or the NOAA Manchester Research Station.

The first offspring spawned from the captive broodstock were released in 2011. Project managers expect the program to peak in 2016 with the release of 1 million juveniles. Based on a conservative survival rate, more than 4,000 adult chinook could return to the South Fork Nooksack in 2019.

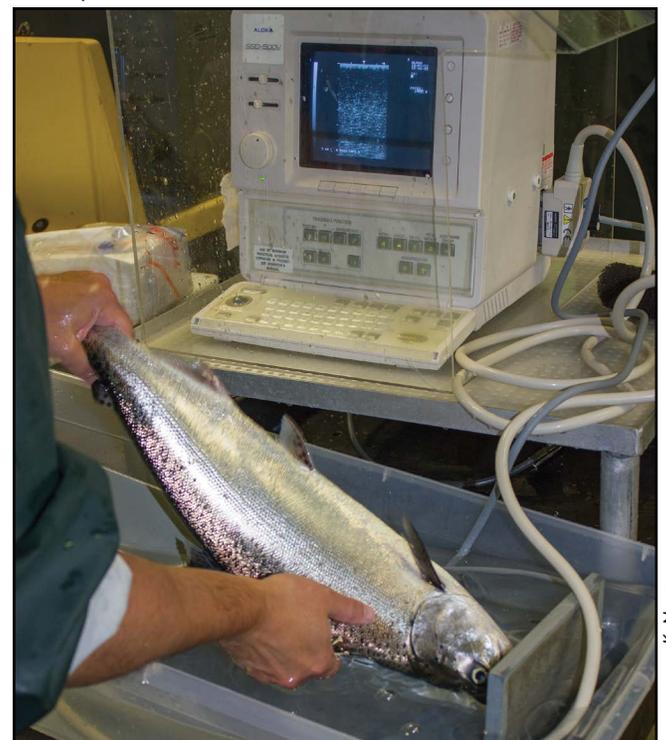
Historically, about 13,000 natural origin South Fork spring chinook spawned in the Nooksack River, but since 1999, surveys estimated that fewer than 100 native spring chinook returned as adults each year. Degraded and lost habitat are the main reasons for the population’s decline.

“We needed to protect this population while we conduct extensive habitat work,” said Merle Jefferson, natural resources director for the Lummi Nation. “Our hope is that these fish, when they return, will jumpstart the population in restored habitat.”

Both the Nooksack Tribe and the Lummi Nation have completed restoration projects on the South Fork to re-establish suitable habitat for salmon to rear, feed and spawn.

— K. Neumeyer

Staff at NOAA’s Manchester Research Station run an ultrasound on a chinook salmon to determine its sex and whether it is ready to be spawned.



K. Neumeyer

Tribes Reduce Elk Damage with Cost-Effective Fence

The Stillaguamish and Tulalip Tribes collaborated with a dairy farm in Acme to put up an elk exclusion fence to minimize pasture damage.

“The farmers have serious damage issues on some of their properties,” said Jennifer Sevigny, wildlife biologist for the Stillaguamish Tribe. “There appear to be a lot of elk spending the majority of the year in and around their farm. This is one way as co-managers we can help address the problem.”

Property owners and farmers in Whatcom and Skagit counties have complained that the recovering Nooksack elk herd destroys fences and devours crops.

“Obviously, the elk want the best feed source, and that’s usually our field,” said Galen Smith, who operates Coldstream Farm with his father-in-law, Jeff Rainey. “We like the elk, but we have to manage them.”

Smith and Rainey, along with tribal staff, put up a three-strand electric fence around the 35-acre pasture. A white ribbon is visible to elk, and reportedly, once one elk gets

shocked by the fence, the whole herd stays away.

“This is two days of work and costs about \$4,000,” said Mike Sevigny, wildlife manager for Tulalip. “If this solves the problem, it’s a pretty economical fix.”

As many as 120 elk at time have threatened Coldstream’s pasture.

“There are 15 bull elk around here right now,” Smith said in August. “We haven’t been able to put the field into corn because of the elk grazing. If we can change the elk’s pattern with this fence, then we can have corn.”

The wildlife managers can monitor elk that have been fitted with global positioning system (GPS) collars to see how they react to the electric fence.

In addition, the tribes plan to set up elk exclusion cages in a variety of agricultural areas to determine just how much the animals are eating. These cages will protect small portions of the pasture and will be compared to the surrounding area to measure elk forage. — *K. Neumeyer*



K. Neumeyer

Assistant fisheries manager for Stillaguamish, Jeff Tatro, left, and Shawn Yanity, who is both chairman and fisheries manager for the tribe, attach a strand to an elk exclusion fence in Acme.

Wildlife Cameras, Hair Samples Track Fishers

Olympic Peninsula treaty tribes are helping monitor fishers that have been reintroduced to Olympic National Park.

Starting this summer, and for the next several years, the Lower Elwha Klallam, Jamestown S’Klallam, Port Gamble

S’Klallam, Skokomish, Makah and Quileute tribes will be collecting hair samples and photos of the small mammals.

animals while hair samples are snagged when a fisher crawls into a tunnel-like box to eat the chicken.



Olympic National Park

A fisher is recorded by a wildlife camera in Olympic National Park. Treaty tribes are partnering with the park and other agencies to monitor the small mammals that have been reintroduced to the park.

Fishers are members of the weasel family, and historically were found throughout the western United States. During the 20th century, however, they were trapped and extirpated from the Olympic Peninsula.

In 1998, the fishers were listed as an endangered species, resulting in a statewide restoration effort. Beginning in 2008, 90 fishers were relocated from British Columbia and reintroduced into Olympic National Park.

To monitor the success of the effort, biologists are luring fishers to stations deep within the park and the peninsula’s forests using raw chicken and skunk scent as bait. Motion-sensor cameras capture photos of the

“The hair snags provide genetic information and help show whether fishers are breeding, while the photographs provide additional information about the population,” said Kim Sager-Fradkin, Lower Elwha Klallam’s wildlife biologist.

The stations are set up for six weeks at a time and checked every two weeks before they are taken down and moved to another spot.

“We have gotten pictures of fishers at four different stations, and are awaiting the results of the DNA analysis to determine if the fishers detected are one of the original 90, or their offspring,” said Patti Happe, the national park’s wildlife biologist. — *T. Royal*

Fish Plants Provide Jobs, Keep Boats on the Water

Nisqually Tribe

The Nisqually Indian Tribe is creating a stable market for tribal fishermen by buying and processing salmon.

“What we’re trying to do here is to make sure tribal fishermen can afford to stay on the water,” said James Slape Jr., Nisqually

Tribe councilmember.

During the last two fall chinook seasons, the tribe purchased a small portion of the tribal catch. They then processed the fish at a nearby tribally leased fish plant and shipped the final product to customers throughout the country.

“Typically buyers will pay premium prices in the first few days of a fishery, and then the price drops because of market demands,” Slape said. “Too much supply inherently drops the price.”

By purchasing less than 25 percent of the harvestable catch at a consistent premium price, competition is encouraged to match the price.

“They’re able to keep the resource price consistently high throughout the season,” Slape said. “Our goal is to make sure that tribal fishers, not only Nisqually, take home livable wages. A good portion of the fishers rely on fishing as a single source of income for their families.”

The tribe also processes fish for wholesale and retail sales. From there, the fish are either sold to tribal casinos or directly to food service accounts.

– E. O’Connell



E. O’Connell

Scotti Wells, Puyallup, helps his uncle Reuben Wells Sr., Nisqually, unload salmon during the Nisqually Tribe’s chinook fishery.



D. Preston

A new fish plant will allow QIN fishermen to ice and process their catch closer to home.

Quinault Indian Nation

Building a new fish plant in Queets fulfills some goals that are always on Quinault councilman Jim Sellers’ mind – providing more jobs and creating more products to sell.

The Queets village of the Quinault Indian Nation (QIN) is located nearly an hour south of Forks on the Olympic Peninsula. It is nearly an hour’s drive to Taholah and even farther to Aberdeen. The remote location results in nearly 85 percent unemployment most of the year.

“We need more year-round employment and this fish plant will help provide that,” Sellers said. The plant will make dog and cat treats from fish, and preserve the quality of local fish by providing immediate ic-

ing and processing.

Harry Butler, QIN fisheries technician, looks forward to helping fishermen improve the quality of their catch with the new plant. Currently, QIN fishermen take their catch to an open shed with a scale and totes.

“It will provide jobs for this community and that’s really important,” he said.

A federal economic development grant helped pay for the project. The contractor, Indian-owned Apollo Inc. of Kennewick, Wash., is using some local labor from Queets for the project. The 4,352-square-foot building is up and QIN is awaiting word on a final grant to finish the interior. – D. Preston