



*A publication of the Northwest Indian Fisheries Commission*

# **Northwest Treaty Tribes**

*Protecting Natural Resources for Everyone*

Spring 2016

[nwtreatytribes.org](http://nwtreatytribes.org)



## **Inside:**

- Coho Fisheries Threatened
- Baker Lake Steelhead Rebound
- Black Cod Broodstock Program Starts
- Chum Fishery Closes Early
- Nooksack Logjams Provide Salmon Habitat
- Tribal Youth Train for Natural Resources Jobs

# Poor Coho Returns Demand Caution



by Lorraine Loomis  
NWIFC Chair

There likely will be no coho fisheries in western Washington this year as returns are expected to plummet even further than last year because of poor ocean survival.

Coho returns in 2015 were as much as 80 percent below pre-season forecasts. The Nisqually Tribe canceled its coho fishery when fewer than 4,000 of the 23,000 fish expected actually returned. The same story was repeated in many tribal fishing areas.

That's why western Washington treaty Indian tribes are calling for greater caution in fisheries management planning this year and sharing the responsibility of conservation more equitably with the state. It is important that we have agreement on in-season management methods and actions before the season starts.

Unlike sport fishermen who can go where fishing is best, tribal fishermen are bound by treaty to traditional fishing places located mostly in terminal areas – such as rivers and bays – that are the end of the line for returning salmon.

Every year we must wait and hope that enough fish return to feed our families and culture. Faced with low catch rates last year, however, most tribal coho fisheries were sharply reduced or closed early to protect the resource. The state, however, expanded sport harvest in mixed stock areas last year to attempt to catch fish that weren't there.

That's not right. The last fisheries in line should not be forced to shoulder most of the responsibility for conserving the resource.

Making matters worse, lack of monitoring by federal fisheries managers last year allowed Southeast Alaska commercial fishermen to exceed their harvest quota by more than 100,000 chinook. Most of those fish were bound for Washington waters.

Coho salmon that managed to make it back last year showed frightening effects of poor ocean conditions. Most were 20 to 30 percent smaller than normal. Females returned with about 40 percent fewer eggs. That will likely result in lower natural and hatchery production and fewer fish in the future.

Right now what salmon need is plenty of good habitat to increase stock abundance and build resiliency to survive the impacts of climate change and poor ocean conditions. Sadly, salmon habitat continues to be lost and damaged faster than it can be restored, threatening the future of the salmon and tribal treaty-reserved harvest rights.

Fisheries management is about the future, and the future doesn't look good for salmon if we don't reverse the trend of habitat loss and damage.

Perhaps most of all we need state and federal fisheries managers to commit to holding all fisheries to the same high conservation standard to which tribal fisheries are held. That includes making the tough decision to close some fisheries to protect returning salmon for everyone.



## Northwest Treaty Tribes

Protecting Natural Resources For Everyone

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

*Northwest Treaty Tribes* is a publication of the Northwest Indian Fisheries Commission and published quarterly. Free subscriptions are available. This edition is online at [nwtreatytribes.org](http://nwtreatytribes.org). Articles in *Northwest Treaty Tribes* may be reprinted.

**NWIFC Chairman Emeritus**  
Billy Frank Jr.

**NWIFC Chair**  
Lorraine Loomis

**Executive Director**  
Mike Grayum

**Communication Services  
Division Manager**  
Tony Meyer

**Regional Information Officers**  
Debbie Preston, Coast  
Emmett O'Connell, South Sound  
Tiffany Royal, Hood Canal/  
Strait of Juan de Fuca  
Kari Neumeyer, North Sound

**NWIFC Member Tribes:** Hoh, Jamestown S'Klallam, Lower Elwha Klallam, Lummi Nation, Makah, Muckleshoot, Nisqually, Nooksack, Port Gamble S'Klallam, Puyallup, Quileute, Quinault Indian Nation, Sauk-Suiattle, Skokomish, Squaxin Island, Stillaguamish, Suquamish, Swinomish, Tulalip and Upper Skagit

Tribal contact information is available under Member Tribes at [nwtreatytribes.org](http://nwtreatytribes.org).

Follow us: Facebook: [facebook.com/nwtreatytribes](https://www.facebook.com/nwtreatytribes)  
Twitter: [@nwtreatytribes](https://twitter.com/nwtreatytribes)  
Instagram: [@nwtreatytribes](https://www.instagram.com/nwtreatytribes)

**On the cover:**  
Quinault Indian Nation member Sean Klatush harvests razor clams from Copalis Beach. See page 8 for story. Photo: D. Preston



**BILLY FRANK JR. DAY**

## **Nisqually Tribe Hosts Billy Frank Jr. Day, Dinner**



*E. O'Connell (2)*

Above: Nisqually tribal member Tony Sanchez and Willie Frank, Billy's son, clean up the banks of the Nisqually River during Billy Frank Jr. Day. Right: A potted Oregon grape plant with one of Billy's famous quotes at a Billy Frank Jr. Day dinner at Nisqually. Attendees were encouraged to take them home to plant.



To honor the second annual Billy Frank Jr. Day on March 9, the Nisqually Tribe hosted a celebration attended by about 500 people. The Nisqually tribal member was the longtime chair of the Northwest Indian Fisheries Commission (NWIFC). He walked on in 2014.

"We are so proud of what Billy has done for the Nisqually Tribe and the world," said Nisqually tribal chair Farron McCloud. "We are celebrating his life today. We're at home with Billy and he is with us tonight in this building. His legacy will live on forever."

Salmon Defense, a nonprofit organization created by the tribes to advocate for salmon and their habitat, is working to share Billy's legacy throughout the region and the country. More information is available at [salmondefense.org](http://salmondefense.org).

Part of that effort includes a school curriculum, developed by Karen Matsumoto of the Suquamish Tribe's Chief Kitsap Academy. The curriculum will be shared with schools throughout the state.

"Every kid should know what he did, what he stood for and what he believed in," said Billy's son Willie Frank, in an interview with The Olympian newspaper. "He didn't do it just for the tribes. He did it for everybody."

A number of tribes already have designated Billy's March 9 birthday as a holiday. Gov. Jay Inslee recently proclaimed the date as "Billy Frank Jr. Day" in Washington.

In May, Salmon Defense holds the annual Billy Frank Jr. Golf Classic fundraising tournament at the Jamestown S'Klallam Tribe's golf course, The Cedars at Dungeness.

In addition, NWIFC has created a Billy Frank Jr. Leadership Award. NWIFC chair Lorraine Loomis said the award will honor exceptional leadership in recognizing, protecting and preserving tribal sovereignty, treaty rights and treaty-protected resources.

"We miss Billy every day. He meant so much to so many of us," Loomis said. "We're going to do everything we can to honor his legacy, share his teachings and continue his good work."

*- T. Meyer*

---

## **Zero Option: Coho Salmon Fisheries Will be Constrained**

Treaty tribes in western Washington are calling on the Pacific Fisheries Management Council (PFMC) to consider a "zero option" for ocean coho salmon fisheries this year.

"We need to at least discuss closing all coho fishing in the ocean this year because of historically low predicted runs," said Lorraine Loomis, NWIFC chair. "I hope it doesn't come to that, but we have to at least consider the option. In some places we're seeing forecasts even below the minimum needed to propagate the next generation of salmon."

This will be the second straight year that coho runs returning to western Washington will have been well below historic levels.

Poor ocean conditions caused by the warm water Pacific blob and El Niño are blamed for the low coho returns.

"We don't know how many we'll see, we don't know how healthy they'll be, and we don't know how many eggs they'll have," Loomis said. "We have never seen runs this low, so we don't know how well they might bounce back."

The PFMC has offered three options to establish parameters for tribal and state fisheries managers in negotiating this year's fishing seasons. It will approve its final harvest guidelines for ocean fisheries in mid-April. *- E. O'Connell*

# Sockeye Salmon Project Helps Steelhead Population



K. Neumeyer (2)

Top: National Parks Service aquatic ecologist Hugh Anthony collects juvenile steelhead from a circular tank at the PSE Baker Lake Hatchery. Above: Natural resources staff from the National Park Service and Upper Skagit Tribe record PIT tag numbers from juvenile steelhead that will be released in the Baker Lake reservoir.

An innovation designed to help juvenile Baker River sockeye salmon may have helped revive a population of steelhead.

Steelhead that don't out-migrate don't undergo the physical transformation necessary to survive in salt water. These fish are the same as rainbow trout. For years, the two dams at Puget Sound Energy's (PSE) Baker River Hydroelectric Project prevented steelhead from leaving Baker Lake, so the population was effectively extinct.

"We haven't put adult steelhead up in the reservoir in eight years," said Jon-Paul Shannahan, fisheries biologist for the Upper Skagit Tribe. "Yet with the new floating surface collectors, we are annually seeing several hundred steelhead smolts leaving the basin."

In 2008, PSE installed the first of two floating surface collectors to help sockeye salmon out-migrate. The second was installed in 2013. The barge-like apparatuses simulate river current to attract and collect juvenile fish from the Baker Lake reservoir before they are transported via tanker truck past the dams. The floating surface collector program has succeeded in releasing larger numbers of juvenile sockeye and coho salmon.

"We're thrilled by the increase in sockeye returns we've seen from PSE's floating surface collector and other collaborative fisheries projects," said Scott Schuyler, Upper Skagit's natural resources director.

Recently, fisheries managers have seen between 200 and 500 juvenile steelhead pass through the floating surface collectors as well. These fish are much larger than the sockeye smolts the collector was

designed for.

"These are resident rainbow trout deciding to go to the ocean because they might have a better chance of survival, or perhaps the density has gotten too high in Baker Lake," Shannahan said.

A highly collaborative partnership between Upper Skagit, Washington Department of Fish and Wildlife, PSE, Skagit River System Cooperative, North Cascade National Park, U.S. Forest Service and National Oceanic and Atmospheric Administration aims to quantify just how good the floating surface collector is at passing steelhead smolts.

Upper Skagit contributed six wild adult Skagit River steelhead, which are genetically the same as Baker River steelhead, for broodstock. The fish were spawned and raised at PSE's hatchery in conditions that mimic natural rearing. About 11,000 juvenile steelhead were implanted with passive integrated transponder (PIT) tags before being released in two different locations: the upper Baker Lake Reservoir, and a couple of hundred yards in front of the floating surface collector.

The tags enable fisheries managers to monitor individual fish movement out of the reservoir, as well as evaluate survival of these fish when they return to the facility as adult steelhead.

"This study could greatly influence the future management of the Baker Lake reservoir and hatchery, as well as help us define recovery goals," Shannahan said. "We plan on taking these results and weaving them into the Skagit Steelhead Recovery Plan under review."

## Elliott Bay Bound

The Suquamish and Muckleshoot tribes and WDFW worked together recently to transfer 450,000 coho salmon to the Elliott Bay net pens. The fish were spawned and raised at Muckleshoot's Keta Creek Hatchery, transferred by WDFW trucks and will be raised in the pens by Suquamish's hatchery staff until they are released later this spring. This program has been in place for more than 20 years, providing fish for both tribal and non-tribal harvest.



T. Royal





T. Royal (2)

Left: Working out of the NOAA Fisheries Manchester facility, technicians wear headlamps with red lights when working with black cod since the fish typically live at 1,000-3,000 feet below the surface. Above: Rick Goetz, NOAA supervisory research physiologist, takes a look at some of the zooplankton grown at Manchester for the black cod program.

## *Jamestown, NOAA Partner on Black Cod Broodstock*

The Jamestown S’Klallam Tribe is collaborating with federal scientists and private investors on a black cod broodstock program in Puget Sound.

“They’re a native fish to Puget Sound, not something like an Atlantic salmon,” said Kurt Grinnell, general manager of the tribe’s aquaculture program. “We don’t need to worry about them being an invasive non-native fish in our waters.”

However, due to changing habitat conditions and development over time, black cod population numbers are low.

“This program is a long-time coming and we want to be a part of it,” Grinnell said. “It’s coming to fruition now.”

There are no plans for the tribe to start a net pen program of its own near Sequim, but it’s a possibility down the road with other tribes, Grinnell said.

For now, the tribe is involved with the National Oceanic and Atmospheric Administration (NOAA) and private investors to sell fry and milt to other hatcheries or companies around the country.

Like geoduck, black cod is highly desirable in Asian countries such as Japan, China and South Korea. The white fish can be prepared in variety of ways, including grilling, smoking, frying and serving as sushi.

The NOAA Manchester facility has been studying the life history and genetics of black cod, also known as sablefish, since 2010. It’s the only hatchery in the United States with a black cod aquaculture program.

“NOAA is interested in putting its research into practice, hence the partnership with others interested in doing the same,” said Rick Goetz, a NOAA supervisory research physiologist at Manchester.

Black cod live in the ocean between 1,000 feet and 3,000 feet in a constant temperature of 41 F. The fish have an elevated lipid (fat) in their muscle to maintain buoyancy at that depth.

Their migration area ranges from Mexico’s Baja Peninsula to the Aleutian Islands in the Bering Sea and they can live up to 60 years.

Females can reproduce up to six times within a 24-48 hour period, producing up to 250,000 eggs total, but it takes five to six years for them to become sexually mature. It’s impossible to tell the sex of the fish by observation, so the technicians use ultrasound to determine gender.

Black cod don’t like bright light so technicians work with them in the dark, with red headlamps in rooms chilled to 41 F.

In the broodstock program, NOAA collects 100 black cod every fall off Westport, then brings them back to the Manchester hatchery for spawning. Between January and March, technicians harvest eggs and sperm from the fish and externally fertilize eggs in glass beakers, similar to how salmon hatcheries conduct their spawning programs every fall.

– T. Royal

## CHUM SALMON

# Nisqually Protects Chum Fishery with Early Closure

The Nisqually Tribe closed its winter chum fishery several weeks early to protect a weak return. The tribal fishery usually lasts until Jan. 20, but was closed three weeks early to protect returning chum.

“Most of the salmon runs that support harvest in Puget Sound are hatchery runs,” said David Troutt, the tribe’s natural resources director. “The Nisqually winter chum run is unique in Puget Sound in a number of ways, including that it is an entirely wild run of salmon that can support harvest. Because of that, if enough fish don’t make it to the spawning grounds, there won’t be large runs in the future.

“We have carefully managed our fisheries together with the WDFW and their recreational fishery, and have reached our escapement goal for Nisqually chum in two of the past four years,” Troutt said. “In general, this year we saw decent runs in our pre-season models (and) decent catches of other chum stocks in Puget Sound. But when the Nisqually fish need



E. O’Connell

Tom Friedrich, natural resources technician with the Nisqually Tribe, surveys the lower Nisqually River for marine mammals.

to come back to the river, they just aren’t there.”

“Winter chum has historically been the most important stock, culturally and economically, to the Nisqually Tribe,” said Farron McCloud, tribal chair. “We want to make sure enough salmon make it up the river to spawn.”

### Marine Mammals Interfere

The tribe suspects that an increased population of sea lions may be having an

impact on winter chum salmon coming back to the river. The tribe funded a study starting this year tracking the impacts of the local marine mammal populations on winter chum.

“We’re estimating that up to a third of the chum run is eaten before they enter the river,” Troutt said. “Sea lion populations have been steadily recovering in Puget Sound since the late 1980s, to the point now we’re seeing very healthy populations.”

Sea lions eat a wide variety of prey, from salmon to pollock or herring, depending on what is available. However, it recently has been discovered that some sea lions specialize in different prey such as winter chum salmon.

“In a way, this problem we’re having with sea lions is at least a compliment to us here in the Nisqually,” Troutt said. “The wild chum run here is healthy, which means it has good habitat to return to. We’ve worked hard to make sure this run is strong.

“Unfortunately, the people who should get the most credit for the health of these fish aren’t able to enjoy it,” he said.

– E. O’Connell

## A Sunrise Seine

Natural resources staff from the Lower Elwha Klallam Tribe and volunteers spent an early morning in December beach seining and monitoring the water temperature of the estuaries at the mouth of the Elwha River. The tribe has been using these methods to collect data about the estuaries since 2006. The Elwha River watershed has been undergoing restoration, including the removal of two fish-blocking dams in 2012 and 2014.



T. Royal

To see a video about the Nisqually Tribe’s marine mammal study, go to [nwtt.co/chumsealions](http://nwtt.co/chumsealions).



# Lamprey Return to a Dam-Free Elwha River



As the Elwha River watershed continues to recover from dam removal, the Lower Elwha Klallam Tribe recently spotted the river's first juvenile Pacific lamprey in a tributary.

Two fish-blocking dams in the Elwha River were removed in 2012 and 2014. Since then, the tribe has seen a variety of recolonization events in the river for the first time in a century, including the reoccupation of Indian Creek by Pacific lamprey.

"This means the adult lamprey that returned to the river after the lower dam was removed in 2012 are successfully spawning," said Rebecca Paradis, a project biologist for the tribe. "This sighting was a confirmation of successful nest building and larval rearing."

Back in 2009, Paradis and other tribal staff observed larval and juvenile lamprey in the river, but none could be found above the lower dam. Since 2012, the tribe has seen adult lamprey make their way into Indian Creek, above the old dam site. Lamprey in their larval stage were observed in 2013 and 2014, but no one had seen juveniles until recently.

The 6-inch-long juvenile lamprey, also called

a macrophthalmia, was found in February in a smolt trap on Indian Creek, where the tribe monitors juvenile fish populations as they migrate to the ocean.

It was unusual that the juvenile had begun its ocean migration so much earlier than normal, compared to lamprey seen in nearby creeks, such as Deep Creek, Paradis said.

"It usually takes four to seven years before the larvae metamorphose into juveniles and migrate to salt water but this guy took only three years," Paradis said.

Lamprey are filter feeders as larvae. As adults, they are parasitic on larger fish and marine mammals. They have a high oil content and are an energy-rich food for salmon, sea lions, seals and other marine species. As filter feeders, they help preserve water quality for other species.

While they look like they belong to the eel family, they are more closely related to the shark and hagfish, and are considered the second oldest fish, next to hagfish.

After adult lamprey spawn and die, they provide nutrients to the system, much like spawned-out salmon. – *T. Royal*

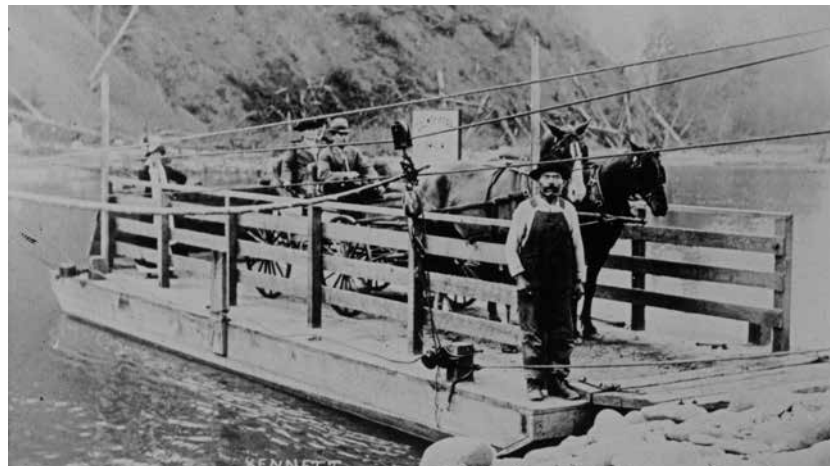


Lower Elwha Klallam Tribe (2)

Top: The first juvenile lamprey found in the Elwha River following dam removal. About 6 inches long, it showed up in one of the tribe's smolt traps on Indian Creek, a tributary to the river. Above: The lamprey's mouth is a jawless toothed opening used for preying on larger marine life.

## GENERATIONS

Lower Elwha Klallam tribal member Joe Sampson uses a barge to ferry people across the Elwha River. Sampson homesteaded on the east and west side of the Elwha River. In addition to fishing and hunting, he had an orchard on his farm and sold fruit to local stores and restaurants.



Lower Elwha Klallam Tribe Archives

# Coastal Beaches Ripe For Razor Clam Harvesting



Clockwise, starting above: The Quinault Indian Nation (QIN) holds a clam dig south of Ocean City on Copalis Beach. Lulu Waugh stands by her lantern before digging in. Waugh, left, and Shugwa Mail dig by lantern light. Mail rinses her harvest. Brenda Brooks and Waugh survey the beach for clams.

Waugh participated in commercial clam digs to support 11 children in her extended family.

"I had a lot of kids to feed and clothe," Waugh said. She also ran the clam processing operation at the tribe's Quinault Pride Seafood for 32 years.

QIN members have harvested razor clams for millennia. Today, tribes and the state co-manage the resource, surveying clams in the summer and splitting the harvest between fall and early spring. Harmful algal blooms reduced the number of harvest days this season for both tribal and non-tribal recreational diggers. What is harvested is sold to area stores and crab fishermen for bait. Commercial clam digs provide QIN tribal members income in the winter when seasonal jobs are scarce and the opportunity to store a traditional food in the freezer for use year-round.

---

To watch a video of a razor clam dig, visit [nwtt.co/2m](http://nwtt.co/2m).



# Bumper Crop at Kalaloch, While Tribe Eyes Blob Effects

It's been years since tribal members could expect to find a reasonable number of razor clams on Kalaloch Beach, south of Forks. For the most part, the beach has been closed except for the occasional tribal subsistence harvest.

Kalaloch is considered the northern end of plentiful razor clam populations on the coast of Washington. Last summer, when tribal and state fisheries technicians conducted their annual surveys to estimate razor clam populations, they got a surprise.

"North of Kalaloch Lodge, they were getting more than 1,000 small clams per half-square-meter sample," said Joe Schumacker, research scientist for Quinault Indian Nation (QIN). "That's just crazy numbers and the total was actually many times more than the combined numbers of what we see on our main three harvest beaches farther south."

The clams were all the same age, so it is believed that a "perfect storm" of currents and tides swept the free-swimming larvae from clams on the southern beaches to the northern shores.

It takes two years for razor clam larvae to grow to a harvestable size of 3 inches or longer. Most do not survive to adulthood. Currents, tides and temperature affect where they settle if they make it to a suitable habitat. As they grow, they are able to dig deeper in the sand and protect themselves from large waves and predators.

Tribal and state technicians have done spot checks on the beach since last summer, and found the number of growing clams still to be remarkably high.

"We're not seeing this recruitment event on the southern end of the beach at all, which really seems to underscore that this was a specific batch of larvae carried by currents that settled in where they were deposited," Schumacker said.

Harvest plans for the clams are on hold until they grow to an appropriate size, which could be in time for the 2016-2017 season.

While Kalaloch Beach will have an influx of razor clams the next few years, shellfish biologists are still keeping an eye on the lingering effects from last year's "blob" of warm water off the Washington coast.

"Harmful algal blooms (HABs) limited harvest opportunity for folks in the fall, and the toxins lingered on some of our beaches through the winter," Schumacker said. The algal plankton *pseudo-nitzschia* produces domoic acid that builds up in shellfish such as razor clams.

Warmer waters foster growth of the algae. At high levels, domoic acid can sicken or kill humans, though it does not harm the clam.

Razor clams have been a part of the QIN diet for millennia as well as helping support tribal members in the winter months when seasonal jobs are scarce.

"We were fortunate some of the beaches cleared up, but one of our main beaches, Mocrocks, was closed for some time," Schumacker said. "We were not able to open it until just recently."

QIN natural resource department employees sample the seawater for elevated levels of *pseudo-nitzschia*, conduct tests for the toxin, and send clams to the state Department of Health for testing. – D. Preston



D. Preston (4)

## EDUCATION PROGRAMS

# Student Trains to Work in Natural Resources

At 21, Tanya Eison already knows where she wants to be in 10 years.

“I want to be the director of the Quinault Indian Nation’s Division of Natural Resources (QDNR).”

Eison has gotten her start through QDNR’s internship program aimed at helping tribal youth overcome barriers to becoming natural resources professionals.

“I started out thinking about what it took for me to become successful and get a job as a wildlife biologist,” said Daniel Ravenel, QIN environmental protection/wildlife manager. Ravenel saw an opportunity in the natural resources budget to create a program to meet hiring and training needs.

“In 2013, we were experiencing a lot of turnover in natural resources,” he said. “I started thinking it would be so much better if we could find a way to give tribal students the education they needed to apply for these jobs. Then the investment would stay in the community.”

With the help of QIN tribal human resources employee Jennifer Scott, a four-year internship program was designed to compete with wages for most local part-time jobs and leave time for college classes paid for by QIN.

“I enjoy being outdoors and that’s one of the great things about this job,” said Eison, who grew up hunting, gathering mushrooms, digging clams



D. Preston

Quinault Division of Natural Resources intern Tanya Eison keeps the head of a tranquilized cougar elevated after being collared.

and fishing. “I was actually surprised just how much the tribe’s natural resources division does for our tribe.”

Ravenel is mindful of the challenges that remain.

“We know we’re asking a lot

with a four-year commitment and it’s a big commitment on the part of the Nation too,” he said. “We hope this can be a model for other tribes as well.”

– D. Preston



D. Preston

Teens from the Quileute Tribal School test ROVs that they built during a workshop supported by President Obama’s My Brother’s Keeper initiative.

## Teens Learn Science, Skills of Remote Operated Vehicles

Teams of tribal teenagers good-naturedly trash-talked one another while maneuvering underwater remotely operated vehicles (ROVs) to retrieve an object in the bottom of a pool. But partisanship dissolved with each successful retrieval and they exchanged mutual kudos.

The Quileute Tribal School students were participating in a workshop in Forks as part of President Obama’s initiative, My Brother’s Keeper, offered by Olympic Coast Marine Sanctuary, University of Washington and Marine Advanced Technology Education.

Research engineer Rick Rupan, who is in charge of deploying ROVs for the university, helped students understand the science behind ROV construction such as buoyancy, thrust, drag and weight.

“The biggest thing we do as engineers is test things over and over,”

Rupan said. “It isn’t going to work the first time, usually. We tinker and test again and again.”

Within 90 minutes, three teams of three students each had designed and built an ROV about the size of a car battery using PVC pipe, three motors and foam for buoyancy. Designs were tested in the pool and fixed on the fly.

The teens’ gaming console skills were on full display; they had no problem using a remote control to maneuver their ROV.

“It’s fun and interesting,” said Eli Owens, 17. “I might consider a job like this.”

Justine Penn, 15, liked the way the workshop stretched her thinking.

“I’m kind of a perfectionist. Having to rethink my design and try something repeatedly was hard,” she said. “I’m pretty open to a lot of things, but it’s definitely something I’d be interested in.” – D. Preston



# Skokomish Lab Testing Water for Threats to Human Health

After eight years of developing a laboratory, purchasing highly specialized equipment and hiring a chemist, the Skokomish Tribe now has a fully functioning water quality lab within its natural resources campus.

Currently the lab is accredited to conduct nutrient analysis of water samples for factors such as total phosphorus, E. coli, nitrite and ammonia.

The next step is to develop testing methods for measuring pesticides in water that come from agricultural activities, which is an important issue in the Skokomish Valley, said Sang-Seon Yun, the tribe's consulting chemist.

"After we focus on pesticides, we can move into emergent contaminants – pollutants that are showing up in the environment that we haven't had to deal with before, like pharmaceuticals and personal care products," said Seth Book, the tribe's environmental biologist.

Both tribal members and non-tribal residents harvest fish and shellfish from Hood Canal, where recent studies have shown that they can absorb a variety of

pollutants, causing a threat to human health.

The lab also will be used as a tool to monitor the effects of climate change, Book said.

"By studying the contaminants and climate change indicators in Hood Canal and Skokomish Valley, we can create a baseline of what's out there," Book said. "We can see how pollutants react to climatic changes, such as extreme weather."

For example, if more pesticides are needed for crops that are affected by heavy rains or droughts, the increased amount of pesticides in the runoff can worsen water quality.

The Skokomish Tribe also is offering the services of its lab to other tribal communities.

"Each tribe has specific water quality issues and we can start a discussion with interested tribes to see how we can help them," Yun said. "One of our biggest strengths is that we're a tribal water quality lab that is concerned with tribal interests. We are flexible and capable of going in any direction." – T. Royal

Top: Seth Book, Skokomish Tribe's environmental biologist, left, talks with Sang-Seon Yun, the tribe's consulting chemist, in the tribe's water quality lab. Bottom: Book works with a water sample.



T. Royal (2)

## EPA's Proposed Water Rule More Protective than State's

The state of Washington proposed a new water quality rule in February that would be less protective than a rule proposed earlier by the federal government.

The treaty tribes in western Washington are encouraging the U.S. Environmental Protection Agency (EPA) to move forward and put their water quality standards into place.

"If the state adopted EPA's proposal, we would have a rule that protects everyone," said Lorraine Loomis, NWIFC chair. "Instead, Inslee is proposing a rule that is less protective and allows more pollution."

Tribes are especially con-

cerned because tribal members routinely consume far more fish and shellfish than most residents.

"The state admits that the current 20-year-old standards don't adequately protect our health," Loomis said. "But their new proposal is a half-step compared to what EPA has put forward."

EPA's proposal would more strictly regulate some of the most toxic chemicals such as PCBs, arsenic and mercury. These three chemicals are responsible for many fish consumption health advisories in the state.

The federal rule also would use the best available science

and follow the most recently updated federal guidelines on those pollutants.

"Inslee's proposal is based on outdated science, especially in accounting for all sources of toxins and how they move through the food chain," Loomis said.

Washington's current water quality standards are based on an estimated fish consumption rate of just 6.5 grams per day, which amounts to less than 8 ounces per month. Because of this underestimate, Washington's water pollution regulations do not protect everyone.

Both the state and federally proposed standards boost this rate to 175 grams a day, which

is still much lower than many documented rates of treaty tribal members' fish consumption.

"We know that 175 is a compromise, that many tribal members eat much more fish than that," said Loomis.

Because the new state standards cobble together old and new criteria, they are less stringent for approximately 80 percent of chemicals than the EPA proposal.

The state Department of Ecology is taking comments on their proposed standards through April 22. To comment on the proposal, visit [nwtt.co/talk](http://nwtt.co/talk). – E. O'Connell



*K. Neumeyer*

The Nooksack Tribe has installed dozens of engineered logjams on the North and South forks of the Nooksack River to improve salmon habitat.

## Two Nooksack Logjam Projects Move Forward

The Nooksack Indian Tribe recently received funding to install 36 logjams that will provide habitat for juvenile and adult chinook salmon in the Nooksack River.

Clearing of forests along the river has deprived the river of large wood that is important for salmon habitat. Chinook populations have declined along with the loss of good habitat. Engineered logjams improve channel stability and create deep pools of cool water.

Over the past several years, the tribe has overseen 15 engineered logjam projects in the North and South forks of the Nooksack River. One of the new projects involves constructing 20 logjams in the Nessel reach, upstream of Acme on the South Fork. The project is the first of three phases designed to increase the number and depth of pools as well as habitat diversity and amount of woody cover.

“Chinook recovery is a top priority for the tribe,” said Gary MacWilliams, director of the tribe’s natural resources department. “These logjams will help form pools that provide important hiding and resting habitat, as well as refuge from high river temperatures, for adult and juvenile chinook.”

The South Fork Nooksack

chinook population is critically low, with fewer than 100 fish returning each year since 2007. Several years ago, the Lummi and Nooksack tribes started a captive broodstock program to preserve the run, but habitat projects are essential to ensure lasting recovery.

Nessel reach is expected to be heavily used by adult chinook returning to the nearby Skookum Creek hatchery as part of the captive broodstock program. Steelhead, cutthroat and bull trout, and coho, chum, sockeye and pink salmon also will benefit from the project.

The 16 logjams in the Farmhouse reach upstream of Kendall on the North Fork are designed to restore stable spawning habitat for chinook by encouraging formation and growth of forested islands that slow rapid channel migration and deliver large wood to the river.

“As with South Fork chinook, habitat productivity of North Fork chinook is extremely low,” MacWilliams said. “Our restoration priorities emphasize placing logjams in the North Fork to restore chinook habitat in the near term, while replanting riparian areas to restore watershed processes over the longer term.” – *K. Neumeyer*

## Story Pole: ‘It’s Mine’



Lummi master carver Felix Solomon (below) created a story pole now on display at the Bellingham Airport.

The airport’s first piece of public art depicts tribal salmon fishermen and a serpent. The serpent represents everything that makes it difficult for people to put fish on the table.

Solomon named the pole “It’s Mine,” because everyone thought the salmon was theirs. He began work on the pole in 2008, partnering with the Nooksack Salmon Enhancement Association to find a piece of artwork for Maritime Heritage Park. The project stalled, but in 2015, the Port of Bellingham got involved and provided the remaining funding needed to complete the project.



*K. Neumeyer (2)*



# Partnership with Colleges Tracks Revegetation

With a newly opened floodplain on the Dungeness River, the Jamestown S'Klallam Tribe and local college students are using the space to study floodplain vegetation restoration techniques.

Students with Peninsula College and Western Washington University's Huxley College of the Environment on the Peninsulas spent a Saturday in February planting more than 300 seedlings of native trees and shrubs, and broadcasting alder seed by hand.

Huxley professor Jenise Bauman approached the tribe about collaborating on a project to study planting techniques in the new space.

"The college's plot study is a good way to look at a variety of methods for floodplain restoration and help determine which works best, including doing nothing at all or using certain types of plants or seeds," said Hilton Turnbull, the tribe's habitat program biologist.

After a major storm damaged a 570-foot-long old wooden trestle over the river in February 2015, the tribe was able to quickly secure funding and a contractor to replace it with a 750-foot-long steel walkway. The old trestle was supported by 185 creosote pilings, blocking the river's ability to flow into the floodplain.

With the new trestle, supported by just four large concrete piers, the river's floodplain is now wide open and ready to support salmon habitat. High flows from recent winter storms already have spilled over the riverbanks and into small side channels under the new walkway.

The new floodplain area was divided into three sections, with four treatments in each section: nothing (control); broadcasting alder seed; broadcasting alder seed and planting bareroot seedlings of trees and shrubs; and just planting seedlings of bareroot trees and shrubs. The plantings will be monitored the next few years by Bauman's students to see how the plants fare.

Students planted native vegetation, such as Oregon grape, ocean spray, Nootka rose, salmonberry and snowberry, which will help support salmon habitat. They'll stabilize soils in the floodplain and prevent erosion of the riverbank. As the trees grow and fall into the river, they will provide refuge for migrating salmon.

"The replacement of the old trestle and opening up the floodplain allows the river to move back and forth like it should, while giving the river breathing room," Turnbull said. "The new walkway gave the river space, allowing for better salmon habitat to develop."

– T. Royal



Jenise Bauman of Western Washington University and Jamestown S'Klallam Tribe habitat biologist Hilton Turnbull discuss the plan for planting vegetation under the new walkway by the Dungeness River.



T. Royal (2)

Peninsula College students Arielle Kelly and John Longworth stake out planting areas for the revegetation project.



# Tulalip to Preserve Wallace River Habitat



Forterra

Tulalip is preserving land along the Wallace River near the state's Natural Resource Conservation Areas in the Sultan Basin, the Mount Baker-Snoqualmie National Forest and the Wild Sky Wilderness.

The Tulalip Tribes, Forterra and the state Recreation and Conservation Office are in the early stages of drafting a management plan for five parcels along the Wallace River in Snohomish County.

Forterra, formerly known as the Cascade Land Conservancy, purchased the 1.23 miles of critical salmon habitat for \$490,000 in July 2015 and transferred the land to Tulalip in November. Snohomish County Conservation Futures and the Salmon Recovery Funding Board funded the purchase.

"Development has caused us to lose habitat faster than we can restore it," said Daryl Williams, Tulalip's natural resources liaison. "This partnership will help preserve habitat that salmon need to survive."

The property will have a conservation easement that ensures it will not be developed.

"We are honored to be tasked with the management in perpetuity of our ancestral lands along the Wallace River," said Tulalip Chairman Mel Sheldon Jr.

Wallace River is a tributary to the Skykomish, which set records for low flows last summer. Thousands of salmon were unable to return to the state hatchery on Wallace River, threatening a population that provides fishing opportunities to both tribal and non-tribal fishermen.

The parcels contain wetlands, riparian habitat and mature forestland, providing habitat for four types of salmon – chinook, coho, pink and chum – as well as bull trout. Its second-growth forests haven't been logged for several decades. While Tulalip doesn't have funding for immediate habitat restoration or protection projects, some forest thinning is possible to allow the remaining trees to grow faster, Williams said.

"This is rich and diverse salmon habitat of great cultural significance and Forterra couldn't be more proud to return this property to the Tulalip people who have stewarded these resources for generations," said Michelle Connor, Forterra's executive vice president of strategic enterprises. – K. Neumeyer

## Bulkhead Removal Restores Soft Shorelines

Right: Shoreline on the Swinomish reservation has been armored with a bulkhead, and lacks habitat for forage fish. Far right: A crane removes the last sections of concrete, opening the area for forage fish to spawn and rear.



Swinomish Tribe (2)

The Swinomish Tribe is working to restore habitat for salmon's key food source.

Shoreline armoring, such as bulkheads and riprap, shuts off the supply of sand and gravel to the beach, leaving behind poor habitat for sand lance and surf smelt, the forage fish that salmon eat.

"While the tribe has strict rules regulating new structures of this kind, much of the impact comes from old bulkheads put in years ago," said Scott Andrews, environmental compliance director

for the tribe's Department of Environmental Protection. "Removing such structures, especially when the land above the tribal tidelands is private fee lands, can be difficult. Agreements must be worked out and money found to pay for the removal."

Fee lands on a reservation have been sold to an owner who holds the title to and control of the property.

After two years of planning and permitting, the tribe removed an 80-foot-long section of concrete on the west

shore of the reservation partly on fee uplands owned by the Norman family and partly on tribal tidelands. The concrete was jack-hammered into sections and then removed by crane and barge by Culbertson Marine.

"Already the area where the bulkhead stood is open for prey species to spawn," Andrews said. "Sediments eroding from the bluff above – previously long blocked – are contributing to the substrate needed for spawning."

In all of Skagit County, more

than half of the soft shorelines already are armored with bulkheads or levees. About one-third of the 30 miles of shoreline on the reservation is armored.

"We know that habitat is the key to salmon recovery," said Lorraine Loomis, Swinomish fisheries manager and NWIFC chair. "That's why we focus so much of our effort on restoring and protecting it. We must do everything we can to protect our remaining habitat as we work to restore even more."

– K. Neumeyer



## WALKING ON



Emmett Oliver

Emmett Oliver, the oldest member of the Quinault Indian Nation and a founder of the revival of the Tribal Canoe Journey, passed away in Edmonds March 7 at the age of 102.

Emmett Sampson Oliver was born Dec. 2, 1913 in South Bend, the son of a Chinook mother and a Cowlitz father. He attended public school in South Bend, boarding school on the Tulalip Reservation, and the Sherman Institute in California. He studied at Bacone College, a two-year Indian college in Oklahoma, then transferred to the University of Redlands in California. He received a degree in biology and education.

He served in World War II and the Korean War in the U.S. Coast Guard before returning to teach and coach at Bacone. He later directed the Indian Student Center at University of California, Los Angeles, directed the Indian Student Program at University of Washington and served as supervisor of Indian Education for the state of Washington. In 1989, he established the Paddle to Seattle, and had been involved with canoe families and journeys ever since.

Oliver and his late wife, Georgia, had three children. Along with his wife, he was preceded in death by son Arne. He is survived by son and artist Marvin Oliver of Seattle; daughter Marilyn Bird of Kingston; nine grandchildren; eight great-grandchildren; and one great-great-grandchild.



William "Willie" Jones Sr.  
*ChaT-ex 'T*

William Jones Sr., *ChaT-ex 'T*, former chairman, vice chairman and council member of the Lummi Indian Business Council for 30 years (1977-2007) passed away peacefully in his home surrounded by his family Feb. 28. Jones was born June 22, 1941.

Jones was known for his commitment to education and was instrumental in the creation of the Lummi Nation High School and Northwest Indian College, where he earned an honorary degree in Native science with a concentration in indigenous self-determination and education.

Jones also was a strong national leader in tribal sovereignty and self-governance and was an active community member in Whatcom County. He was a canoe skipper for many years and carried the canoe philosophy in all aspects of life.

He is survived by his wife of 45 years, Josephine Jones; children Rosanna (Wendell) Jones, William (Regina) Jones Jr. and Julianne (Delfred) Jones; 14 grandchildren; seven great-grandchildren; and sister, Rosalie (Ralph) Scott. He was preceded in death by his parents Earl and Mildred Jones and his daughter Evelyn Jones (baby).

Justin Finkbonner  
*Squi-shea-mut*

Justin Callin Finkbonner, *Squi-shea-mut*, passed away Dec. 15, 2015. He was born Jan. 10, 1974 to Barbara Llyall and Rick Finkbonner.

Finkbonner attended Western Washington University and worked at Northwest Indian College.

He loved Native art, carving and canoe journeys. He was skipper of the Lummi Youth Canoe Family.

Finkbonner is survived by his sons Kaiden Finkbonner (mother Nina Old Coyote) and Liam Finkbonner (mother McKenna Hoffman); father Rick Finkbonner; brother Rob Sawyer; aunts Janice Ackley and Karen Stralton; and many nieces, nephews, cousins and friends. He was preceded in death by his mother Barbara Llyall-Gamba; uncles Clayton and Brian Finkbonner; grandmothers Shirley Schneider and Marlene Finkbonner; grandfather Richard Finkbonner; and nephew Scheyi'ye-lut Anthony Bright.



Phillip Edwin Martin  
*Hunaschult*

Quinault Indian Nation elder Phillip Edwin Martin, 85, passed away Jan. 2 at his family home in Taholah. His Indian name was *Hunaschult*, or Thunder Elk.

Martin was born in Aberdeen to Clara Bagley and Edwin Martin. He attended several schools, including Clearwater School and Taholah High School, and graduated from Peninsula College in 1979.

Martin served for many years as a member of the Quinault Business Committee under four Quinault presidents – James "Jug" Jackson, Joe DeLaCruz, and Martin's two nieces, Pearl Capoeman-Baller and Fawn Sharp. He managed the Quinault National Fish Hatchery for 25 years. He also was Enterprise Manager and manager of Quinault Land and Timber until his retirement in the mid-1990s.

He was a fisherman, hunter, clam digger, scuba diver, baseball enthusiast and strong supporter of tribal education, culture and treaty rights. Martin was a fishing guide, featured on several television programs and well known in the sportfishing world. He was a supporter of the annual Tribal Canoe Journey and traveled extensively to participate.

He is survived by wife Lynell Watt; nine children; five sisters; and three brothers. He was preceded in death by his wife of more than 40 years, Rose Martin; and son Terry Lee James.



Gary Graves

Beloved husband, father, brother, son, grandpa, uncle and friend, Gary Richard Graves passed away March 10 at St. Francis Hospital in Federal Way. He died of pneumonia, a complication of multiple system atrophy (MSA), a rare neurodegenerative disease that can originally appear as Parkinson's disease.

Born May 17, 1949 in Newport, R.I., he was a graduate of Mercer Island High School and the University of Washington.

He retired in 2015 from the Northwest Indian Fisheries Commission as director of fishery services, where he worked from 1976 until 2015. He was fortunate to have a career that he genuinely loved and believed in – to help preserve the natural resources that made his passion for fishing possible.

He is survived by his wife, Bonnie of Federal Way; daughter Jennifer Graves and her husband Joaquin Artes, and grandson Nicolas Artes, all of Madrid; daughter Natalie Graves of Seattle; sisters Sally Machlis, Susan Sullivan and Barbie Bond; parents Jack and Kathy Graves; his nine nieces and nephews; and dear friends.

A celebration of his life is planned for late June. The family requests that memorial donations be given through CurePSP at [psp.org/donate/ways-to-give.html](http://psp.org/donate/ways-to-give.html). An online guestbook is available at [Legacy.com](http://Legacy.com).

## Featured on the Northwest Treaty Tribes YouTube Channel

---

Watch: [nwtt.co/ourstories](http://nwtt.co/ourstories)

Archie Cantrell



“They used to tell stories that the Salmon People and the Native Americans had to go to war to figure out who was going to be the food.

“We consider salmon as family.”

*Archie Cantrell*  
*Puyallup tribal fisherman*

Daniel Kuntz



“Protecting salmon is more than a job; it evolved from a lifetime of fishing.

“Who else is going to stand up for the fish other than the fishermen?”

*Daniel Kuntz*  
*Squaxin Island tribal fisheries biologist*

North 40 Productions (2)