NWIFC News

Northwest Indian Fisheries Commission

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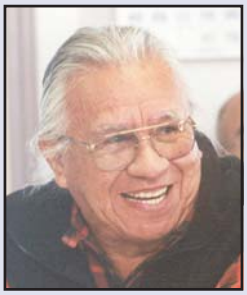
Being Frank

Don't Wave Goodbye

By
Billy Frank Jr.
Chairman



Thousands of fishermen took to Lake Washington recently to fish for sockeye – arguably the most prized salmon in the Northwest. More than 50,000 sockeye were harvested by treaty tribal and non-Indian fishermen in the Lake Washington fishery. It was a thing of beauty to see this harvest accompanied by more than 100 traditional tribal cedar canoes gliding through the lake, the culmination of the annual canoe journey hosted this year by the Muckleshoot Tribe.

The canoes opened many eyes to the long-practiced traditions of the tribes in the Pacific Northwest. So did the sockeye fishery, which must be credited to another long-practiced tradition – cooperation.

This valuable fishery didn't just happen on its own. It was the result of hard work by tribal and state co-managers of the Cedar River system who produced most of these fish using a balanced approach to protect and restore salmon habitat while enhancing the runs through science-based hatchery programs.

In some important ways, King County is traveling the right path to protect salmon habitat. Last year, the county put a new Critical Areas Ordinance into effect, the most powerful tool local governments can use to help salmon.

Despite being the most urban and most populated county in the region, King County has seized the opportunity to do the right thing by adopting new rules to protect water quality, restore wetlands and support in-stream salmon habitat. King County did all of this with minimal disturbance to private property rights and maximum benefit to everyone who lives in the Puget Sound region.

In the months since enacting those rules, leaders in King County have been attacked locally and now through a statewide initiative, I-933. Such actions are, unfortunately, as predictable as they are ill-advised.

There always seem to be those who put their own interests above everyone else's. I-933 is a destructive and greedy initiative that should be sent back to its promoters with a dead sockeye wrapped inside.

If the so-called "property rights" initiative is approved by voters in November, we can start waving goodbye to many things that make the Puget Sound region a special place to live — not the least of which would be sockeye fishing on Lake Washington. We can also wave goodbye to any rightful claim that we are good stewards of the environment.

I-933 would effectively replace critically important environmental protection laws in favor of lawlessness in the form of property rights run amuck. This initiative would cost the state, and all the rest of us, more than we could ever afford to pay. It would wreak havoc with the environment we all depend on and tie us up in court for decades to come.

Whether you're Indian or non-Indian, fishing is a true measurement of the environmental and economic health of the Northwest. These two strengths are always ultimately connected. If there is no fishing because of an unhealthy environment, or poor governmental choices, society will not long prosper.

NWIFC News

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On The Cover: Tribal paddlers make their way through the Ballard Locks and into Lake Washington as part of this year's annual canoe journey. This year's event was hosted by the Muckleshoot Tribe and coincided with an unusually large return of sockeye to the lake.

Photo: T. Royal

Sockeye Run Floods Lake Washington

Suquamish, Muckleshoot and Tulalip tribal fishermen took part this summer in one of the largest ever Lake Washington sockeye fisheries. More than 472,000 sockeye returned to Lake Washington; tribal and non-Indian fishermen evenly split a harvest of nearly 120,000 fish.

The last two Lake Washington sockeye fisheries occurred in 2000 and 2004, when 376,000 and 415,000 sockeye returned, respectively.

Muckleshoot fishermen Tony and Leeroy Lozier land their catch of sockeye at Fisherman's Terminal. *Photo: E. O'Connell*

"I would characterize it as an unexpected opportunity," said Jay Zischke, Suquamish's marine fish program manager. "We were surprised at the strength of the run. It was a very welcome opportunity."

Tribal and state salmon co-managers weren't expecting enough sockeye to pass through the Ballard Locks to allow a fishery this year. "We only expected just over 200,000 sockeye. This many sockeye were not totally unexpected, however, because of what we saw with sockeye fry production in 2002," said Mike Mahovlich, fisheries biologist for the Muckleshoot Tribe, which counts sockeye as they pass through the locks. "If we didn't have that in-season information, we likely would not have fished."

"It turned out better than predicted," added Rob Purser, Suquamish fisheries manager. "I think everyone was glad there was enough to fish."

The unusual abundance of fish, as well as the proximity of the tribes' reservations, allowed fishermen of all ages to take advantage of the fishery. "We often see more younger fishermen out there because only minimal equipment is needed," Zischke said.

"It's the one species that fishermen like to catch and it's usually one of the first fish of the year that returns to local waters," Purser said. – *E. O'Connell & T. Royal*

Tribe Tracks Sockeye To Explain Disappearance

The Muckleshoot Tribe is tagging thousands of Lake Washington sockeye to find out why many of them are disappearing between the time they enter the lake and spawn.

In the last few years, tens of thousands haven't shown up on the spawning grounds. "We get pretty accurate counts as they enter the lake and once they reach the spawning grounds," said Mike Mahovlich, fisheries biologist for the Muckleshoot Tribe. "We don't know why thousands just seem to disappear after spending two to four months in the lake."

The tribe suspects it might have something to do with increasing water temperatures in Lake Washington and the Lake Washington ship canal, so they're attaching temperature tracking tags to hundreds of sockeye. "If we find these fish are spending significant time in hot water, maybe then we have found one of the potential causes of why there is missing fish from the locks to the spawning grounds," said Mahovlich.

The ship canal is an artificial waterway built in the early 20th century that connects Lake Washington with Puget Sound. "The ship canal and the lock system aren't natural, so salmon haven't had a long time to evolve and adapt to this new environment and, therefore, are exposed to some very harsh conditions," said Mahovlich.

Muckleshoot technicians Moon Martin and Lena Chavez insert a tag into an adult sockeye at the Ballard Locks in Seattle. *Photo: E. O'Connell*

About 300 fish will be fitted with acoustic tags and tracked throughout the lake until October, when they start entering the creeks and rivers that feed Lake Washington. "We don't have a good understanding how the canal affects the sockeye as they move through, but having this many acoustic tags out there should give us some valuable information," said Mahovlich.

Thousands of sockeye passing through the locks will also be tagged with numbered tags that will give the tribe a better idea of how many fish that pass through the locks make it to the spawning grounds. "All of this new data collected this year will be very important in building our knowledge of these fish," said Mahovlich.

"The tribe has always paid close attention to these fish and that is why it is crucial to keep collecting new data because we want to make sure this run is successful now and long into the future."

– *E. O'Connell*

Quinault Indian Nation:

Research Needed On Low Oxygen Zone

More research is desperately needed to better understand a phenomenon that resulted in two large fish kills in the Pacific Ocean off the Quinault Indian Nation's reservation.

In mid-July and again at the end of the month, large numbers of shallow bottom-dwelling fish, such as cabezon, wolf eels and crab, washed up on QIN beaches from south of Taholah to near Ocean Shores. Meanwhile, QIN fishermen were pulling up eerily empty pots or pots full of dead crab. "In the modern era of fisheries management, no one remembers ever seeing anything like this," said Ed Johnstone, fisheries policy representative for QIN.

Thousands of marine fish were killed by an area of low oxygen in waters off the shores of the Quinault Indian Nation. *Photo: D. Preston*

The Quinault event may be linked to a dead zone of low oxygen water that has been monitored off the Oregon coast for the past five years and has annually grown steadily larger. The dead zone is created by a natural upwelling of dense, oxygen-poor but nutrient-rich water that supports the aquatic food chain. Oregon State University researchers are exploring the idea that the normal ocean winds and currents have changed, reducing the necessary mixing of ocean waters.

"This is cold, dense water that comes up from the deep," said Joe Schumacker, operations section manager for QIN fisheries. "Though there's still less dense, oxygenated water near the surface, as the deep oxygen-starved water moves toward shore, it begins to take over the entire water column, like fog moving into an area.

> **'In the modern era of fisheries management, no one remembers ever seeing anything like this.'**
>
> *– Ed Johnstone, QIN Fisheries Policy Representative*

"Species like wolf eels and lingcod live in 100 feet or less of water and aren't adapted to low oxygen levels like deep-water species. They are also pretty territorial and tend to stay in their little spots, so they either die there or swim toward shore to escape and just run out of room," said Schumacker.

A buoy that monitors ocean conditions recorded extremely low oxygen readings in the waters off QIN beaches just before each of the fish kills. "We only have the one monitoring device off our shores here but it doesn't provide enough information," said Johnstone. "We need additional and more accurate monitoring devices and more research to understand what's going on."

The QIN is supporting several new research proposals related to the phenomenon, including a University of Washington research plan to add additional monitoring equipment off the Washington coast.

Similar oxygen-poor zones are found in Hood Canal, the Gulf of Mexico and other parts of the world. Most of these areas, however, are believed to be caused by pollution.

"There is just so much we don't know and now we're playing catch up to understand these events," said Johnstone. "We know these kinds of things happen; it's just the first time it's happened to us and we're concerned." – *D. Preston*

In The Bag

Quileute fisheries technician Dean Jackson releases a Sol Duc River summer chinook into a holding pen with technician Beau Adamire at the oars. The work is part of a tribal broodstock program aimed at bolstering the wild run. *Photo: D. Preston*

Tribe Working To Preserve Elwha Steelhead

Lower Elwha Klallam tribal habitat manager Mike McHenry slowly wades through the Elwha River, scanning the river's bottom for an orange-colored patch of gravel.

The marking, applied earlier by tribal fisheries staff, indicates a steelhead redd – a gravel nest in a riverbed where salmon eggs are deposited, fertilized and hatched. The tribe has been gathering more than 1,000 fry annually for the last couple years from redds in the lower five miles of the river as part of its late winter steelhead broodstock program.

By establishing a broodstock, the tribe hopes to prevent damage to the native salmon run when the Elwha River dams start to come down in 2009. The fish are proposed for listing as "threatened" under the federal Endangered Species Act.

> **'We think the steelhead fry we are collecting are remnants of the wild run. . .'**
>
> *– Mike McHenry, Habitat Manager, Lower Elwha Klallam Tribe*

The fry are being raised as part of the captive broodstock project at the tribe's hatchery. The fish will be reared to adulthood and then spawned to produce native juvenile steelhead. This offspring will be released as yearlings into the river, depending on the water conditions during the dam removal process. As the native steelhead population increases, releases of non-native steelhead from the tribe's hatchery will be reduced.

The first group of native fry captured last year has been doing well since being moved from incubation, said Larry Ward, the tribe's fisheries biologist.

"Learning how to best rear fish that have not undergone domestication in the hatchery environment is a challenge," Ward said. "We are working closely on this project with our counterparts from National Oceanic and Atmospheric Administration Fisheries and Washington Department of Fish and Wildlife."

Lower Elwha Klallam tribal staff, from left, Larry Henderson, Ray Moses, Keith Lauderback and Mel Elofson collect steelhead fry for the tribe's broodstock program. *Photos: T. Royal*

Developing the native steelhead broodstock will help the fish survive the massive changes in the river – such as greatly increased sediment levels – that are expected to occur when the dams are removed, McHenry said.

Captured steelhead fry are taken to the tribe's hatchery, where they will be reared to adulthood and spawned, producing a broodstock of Elwha River native steelhead.

The two fish-blocking dams, the 108-foot Elwha dam and 210-foot Glines Canyon dam, were built in the early 1900s to provide hydroelectric power. Both dams were built without fish ladders, preventing fish from migrating upstream to spawn. Currently, salmon and steelhead can only spawn below the dams, in the lower five miles of the river.

The dams are owned by the federal government; Olympic National Park is spearheading the removal effort. The total cost of the project is estimated at $182 million.

"We think the steelhead fry we are collecting are remnants of the wild run that's been impacted by the construction of the dams and the importation of non-native stocks of fish," McHenry said. Like many other streams in the region, a population of non-native steelhead from Chambers Creek in southern Puget Sound had been propagated and released in the Elwha.

The tribe is collecting fish from selected redds to ensure that a diverse genetic pool within the stock is maintained. A population geneticist from NOAA, Gary Winans, has been assisting with the project by taking tissue samples from each fish collected and comparing their DNA to native and non-native stocks.

"We're relatively certain these steelhead fry are part of what's left of the native stock," said McHenry. "The genetic studies of the fry we gathered will confirm that."

The project is being funded in part by the Pacific Coastal Salmon Recovery Fund. – *T. Royal*

Tribe Monitors Spread Of Pollution In Oakland Bay

For the past two summers, bacteria levels have mysteriously increased in Oakland Bay. By conducting a circulation study of the bay, the Squaxin Island Tribe hopes to confirm how tidal currents spread upland pollution.

John Konovsky, Squaxin Island tribal environmental program manager, deploys a drogue in upper Oakland Bay, assisted by volunteer Don Martin. *Photo: E. O'Connell*

"The increase in bacteria during the summer months is unusual," said John Konovsky, environmental program manager for the Squaxin Island Tribe. "Typically, pollution spreads when it rains, but here we are trying to figure out what happens in the summer." Oakland Bay is the nation's leading source of manila clams and the center of the Squaxin Island Tribe's shellfish culture and economy.

Using drogues — weighted buoys pulled along by currents — tribal staff can determine how upland pollution is carried to different parts of the bay. Geographic Positioning Systems devices are attached to the drogue buoys, so each can be precisely tracked and their movement plotted.

> **'We've learned from other areas that once a shellfish bed is closed to harvest, it is very hard to get it open again.'**
>
> *– Andy Whitener,*
> *Natural Resources Manager,*
> *Squaxin Island Tribe*

In addition to the circulation study, the tribe is also working with the federal government to track down pollution sources by using DNA. Each source of fecal coliform bacteria, whether human or animal, can be determined through DNA analysis. "By tracking the DNA in the pollution, we can determine if pollution is coming from failing septic systems, or some other source, such as farm animals," said Konovsky.

Several shellfish beds in Oakland Bay are likely to close if nothing is done to stem the flow of pollution. "We've learned from other areas that once a shellfish bed is closed to harvest, it is very hard to get it open again," said Andy Whitener, natural resources manager for the tribe.

In addition to being the most productive shellfish area for the tribe, Oakland Bay also provides jobs to many in Mason County. Several shellfish growers are among the top employers in Mason County.

"Oakland Bay is very important to the tribe, both economically and culturally," said Whitener. *– E. O'Connell*

Dam Ruling Favorable To Skokomish Tribe

An opinion handed down from a U.S. court of appeals in August regarding the impact of the Cushman dam on the Skokomish Tribe is being viewed as a positive turn for the tribe.

The U.S. Circuit Court of Appeals for the District of Columbia ordered the Federal Energy Regulatory Commission to impose environmental conditions proposed by the Department of Interior (DOI) as requirements for a license for the City of Tacoma to operate its hydroelectricity facility in Hoodsport.

"It was favorable to the tribe," said Dave Herrera, the tribe's fisheries and wildlife policy director. "We're very pleased with it."

The tribe says operation of the dam has diverted most of the flow from the North Fork Skokomish River and destroyed salmon populations, violating the tribe's treaty-reserved fishing rights.

The two-dam facility was constructed in the 1920s; its operating license expired in 1974. FERC re-issued a license in 2004 with environmental conditions that included requirements for fish passage and maintenance of flow levels. The City of Tacoma appealed the license to the court in Washington D.C., arguing that the conditions would render the project uneconomical for the city. The tribe and DOI also appealed, arguing that the conditions were not strong enough.

The August federal court ruling states that if FERC chooses to reissue the license, it must include the stronger environmental conditions.

Meanwhile, the tribe continues efforts to improve habitat throughout the Skokomish River watershed. The tribe, in partnership with the City of Tacoma and Mason Conservation District, recently received $990,296 to put toward removing more than 3,000 feet of dike on the Skokomish River delta. The dike, built in the early 1940s, has prevented the delta from receiving a natural tidal flow, severely affecting the health of the estuary and eliminating important juvenile salmon rearing habitat.

– T. Royal

On Tributary To Hoh River

Culvert Removal Adds Fish Habitat

One of the most productive coho tributaries to the lower Hoh River just got even better for fish, thanks to the removal of a fish-blocking culvert on its upper reaches.

Tyler Jurasin, Hoh Tribe fisheries biologist, crouches in a fish-blocking culvert that was removed on Braden Creek. *Photos: D. Preston*

"Anytime there is an opportunity to get one of these fish-blocking culverts out, the tribe wants to remove it," said Tyler Jurasin, fisheries biologist for the Hoh Tribe. One of the tribe's highest priorities is addressing fish passage problems in the Hoh watershed. The $60,000 Braden Creek project is a cooperative effort between the Hoh Tribe and private timberland owner Rayonier.

In addition to opening about 1.5 miles of habitat for fish, the project is reducing the possibility of a catastrophic mud flow. "This is an undersized culvert that had approximately 1,500 yards of dirt and clay on top of it," said Jurasin. "If the culvert had plugged up with debris during high flows, which these smaller-diameter culverts frequently do, water would have backed up until it blew out all this fill dirt. Not only would it kill thousands of fish and wipe out miles of fish habitat downstream, it would devastate future fish production for years to come."

The 5-foot diameter culvert was removed and the stream bed re-graded to its historic slope. Tribal crews placed sediment-trapping jute mats and hay on the restored slope and also planted willow trees and grass seed to establish a stabilizing ground-cover as quickly as possible. Fish were trapped, removed from the area and blocked from returning during the project to protect them from the effects of the work.

Will Hudson, Hoh tribal fisheries technician, spreads hay over jute matting to control erosion on a slope that replaced fill dirt atop the culvert.

"This project is the culmination of a great deal of work by many people over time and fish will benefit," said Tim Snowden, natural resources director for the Hoh Tribe. – *D. Preston*

Project Reconnects Acres Of Nisqually River Wetlands

The South Puget Sound Salmon Enhancement Group, with help from the Nisqually Indian Tribe, is reconnecting acres of wetland with the Nisqually River. The project involves removing a culvert near the mouth of McKenna Creek, two miles downstream from a 12-acre wetland.

"These wetlands will give juvenile salmon a place to rest and feed as they prepare to move out to sea," said Teresa Moon, SPSSEG project manager.

Salmon and trout that spend more than a year rearing in freshwater before moving out to sea will especially benefit from this project. "Not all salmon leave for the ocean in the first year. They need wetlands like these," said Moon. "They use them to feed, hide from predators and as calm refuge during winter floods."

During a recent study in the Nisqually, tribal and enhancement group biologists found more juvenile chinook salmon staying in freshwater longer than had previously been observed. "This is a life history option that we weren't sure existed much in the Nisqually until recently," said Jeanette Dorner, salmon recovery manager for the Nisqually Tribe. "It's important since these fish are using the Nisqually for a longer period of time, that they have enough habitat to thrive."

Another species that will likely benefit from the project in particular is coho salmon. As juveniles, coho spend more time in freshwater than any other species. "Coho come back to the Nisqually in very small numbers, in the hundreds every year," said Moon. "They need as much habitat as they can get."

Steelhead, which are being considered for listing under the federal Endangered Species Act, also spend more time in freshwater.

The project follows up an effort begun three years ago by the enhancement group and the tribe to catalogue important off-channel habitat throughout the watershed. "This section of the river is particularly deficient in off-channel wetlands," said Dorner. "This project is targeted to provide more access in this particular reach."

The project is being funded through the Family Forest Fish Passage Program, which aids habitat restoration projects on small, privately owned forestry land. "Forest landowners are required to reconnect blocked salmon habitat but we are happy to help out," said Dorner.

– *E. O'Connell*

Engineered Logjams Improving Salm

Editor's Note: Engineered logjams have become an accepted means to help salmon. The structures trap gravel needed for salmon spawning, create deep pools with cool water to help resting salmon, provide cover for young salmon to escape predators, and also direct water into side channels, expanding salmon access to flood plain habitat. Following are four examples of how the treaty Indian tribes in western Washington are using engineered logjams to improve salmon habitat.

A Chinook helicopter was used to install logjams the South Fork of the Tolt River. *Photo: Tulalip Tribe*

Tulalip Project Will Aid Salmon, Research

Scientists agree that engineered logjams are effective in improving salmon habitat. But how well do they work? In what specific contexts are they especially effective? These are questions that only a comprehensive monitoring program can achieve.

After working with partners on a logjam project to enhance habitat in the South Fork of King County's Tolt River, the Tulalip Tribes are using Timber, Fish and Wildlife Forests and Fish Report funding to answer these and other questions. This monitoring will have wide implications for salmon recovery, now and in the future.

"We generated objectives to improve habitat in the river for both chinook and steelhead," said Abby Hook, a hydrologist with the Tulalip Tribes. "Our monitoring work will help determine whether we met those objectives."

Last October, after more than a year of planning, the tribes worked with the City of Seattle, the U.S. Fish and Wildlife Service, the Washington Department of Fish and Wildlife and the National Oceanic and Atmospheric Administration to place 35 large logs, seven bundles of smaller logs and 100 cubic yards of rock ballast in the river by helicopter in order to enhance salmon habitat.

Puget Sound chinook, one of the project's beneficiaries, are listed as "threatened" under the federal Endangered Species Act.

Two comprehensive studies on river habitat conditions were performed before the project began. Scientists found that the main factor limiting fish production in the area was too much of the wrong type of sediment. The dam was found to block gravel and small cobbles resulting in substrate that was larger than optimal for spawning chinook.

"We wanted to recruit sediment that is the right size for spawning chinook and steelhead," said Hook. "We also wanted to increase access to floodplain habitat by introducing water to side channels."

Re-introducing water to historic side channels could have significant benefits for rearing salmon and trout in the area.

"So far, we know that we've increased flows into more than a mile of side-channel habitat," said Hook.

Tulalip is leading the monitoring effort in conjunction with Seattle City Light. This project helped fulfill mitigation required of Seattle City Light, owner of the Tolt Hydroelectric Project upstream in the South Fork of the Tolt. Tribal crews began the monitoring last fall. – *J. Shaw*

In Eatonville, City Park Transformed Into Salmon Habitat

The Nisqually Tribe and the South Puget Sound Salmon Enhancement Group are replacing a rock berm with a series of logjams at Eatonville's Smallwood Park to improve salmon habitat in the Mashel River.

The 10-foot-tall berm was built along 300 feet of the river to prevent erosion of Smallwood Park, but at the same time has impeded salmon spawning and rearing in the Mashel River. "The habitat around Smallwood Park isn't good at all for salmon," said Jeanette Dorner, salmon recovery manager for the Nisqually Tribe. "The berm constricts the river, intensifying flow, making it hard for salmon nests to survive, and there isn't anywhere for young salmon to rest or feed."

The series of four logjams along the river near the park will serve the dual purpose of protecting the park from erosion and providing habitat for salmon.

A similar project downstream of the park completed two years ago is already showing benefits to salmon. "We've seen a 60 percent increase of young coho salmon using the habitat created by those logjams," said Dorner.

Coho salmon spend more time in freshwater than other salmon before migrating to the ocean so they benefit more from freshwater habitat improvements. "Coho salmon have been struggling in the Nisqually for years. By improving their habitat, we give them a better chance at surviving," said Dorner. – *E. O'Connell*

Contractors begin constructing one of four logjams on the Mashel River. *Photo: E. O'Connell*

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Even Small Creeks Can Benefit From Logjams

Joe Puhn, Squaxin Island Tribe natural resources technician, scrambles up a newly built logjam on Little Skookum Creek. *Photo: E. O'Connell*

The Squaxin Island Tribe is restoring salmon habitat on a stream that runs through the tribe's reservation by building a half-dozen log jams.

"Salmon are important to the tribe today, both culturally and economically," said Andy Whitener, the tribe's natural resources director. "Our connection to salmon means that we want to restore and protect their habitat."

To open the valley for farming, Skookum Creek was straightened from a meandering stream into a ditch. "Fast, straight streams aren't good habitat for salmon," said John Konovsky, environmental program manager for the tribe. "Juvenile and adult salmon need slow water so they can rest and feed."

This year's project follows the successful restoration of a lower portion of the creek, where six logjams were built.

In addition to putting logs back into the creek, the tribe is creating the conditions that lead to logjams in the first place by planting more than 2,000 conifers along the creek. "While logjams provide a quick fix, trees along the creek will make sure the solution works in the long run. Eventually these trees will shade and cool the creek," said Konovsky. "Many of the trees will also fall into the creek, creating logjams that will slow the water and create habitat for salmon."

Wild coho salmon, which spend more than a year in freshwater before moving out to sea, will especially benefit from improved freshwater conditions. "Wild coho in the South Sound have been in a prolonged slump for more than a decade," said Konovsky. "Improving their habitat is the most significant thing we can do to recover them."

The restored stretch of Skookum Creek runs behind the tribe's casino and is just off Highway 101. "This creek runs right through our reservation, past our houses. This is the creek we see everyday," said Whitener. "Skookum may be a small creek, but to us it's important as any other." – *E. O'Connell*

Lummi, Nooksack Tribes Complete Landmark Habitat Project

The Lummi Nation and Nooksack Indian Tribe this summer completed the largest habitat restoration project yet attempted on the South Fork of the Nooksack River. By removing portions of obsolete dikes, constructing engineered logjams and returning badly-needed wood to the river system, the tribes' work at Hutchinson Creek will take critical steps toward preserving threatened chinook salmon and bull trout populations.

The project, on the South Fork at the mouth of Hutchinson Creek, will be a tremendous boon to endangered fish and will also reduce risks to homeowners from future flooding.

"This is a major step toward restoring the area's natural habitat functions," said Bob Kelly, director of Nooksack Natural Resources. "Removing the dikes will allow the river to form more productive habitats and restoring large woody debris to the river will provide much needed hiding and resting cover for holding and rearing salmon."

Michael Maudlin, a geologist with the Lummi Nation, surveys the Hutchinson Creek site. *Photo: J. Shaw*

While the work will especially benefit chinook salmon and bull trout, both listed as threatened under the federal Endangered Species Act, several other species that use this stretch of the river will benefit as well. Steelhead, coho salmon, chum salmon, sockeye salmon, pink salmon and sea-run cutthroat trout all use either Hutchinson Creek, the surrounding portions of the South Fork, or both.

The presence of dikes constrained the river's flow, increasing scour and diminishing the amount of floodplain habitat available to fish.

"Removing the dikes and introducing logjams will have numerous benefits," said Michael Maudlin, a geologist with the Lummi Nation. "For one example, this project will create deep pools in areas where cool tributary waters flow into the river from Hutchinson Creek, giving fish the ability to rest in the cool waters they need for refuge in summer."

This initiative is the largest-scale salmon recovery project on the South Fork, both in terms of scope and of ecological significance. The project aims to help bring back local chinook salmon and bull trout back to self-sustaining levels. – *J. Shaw*

Tulalip Tribes Project Benefits Purple Martins, Wood Ducks

Along Coho Creek, Alan Cortez steps toward the cedar box, gently opening its face to reveal the contents – cedar shavings, feathers and a spent wood duck eggshell that feels more like vinyl than the brittle husk of a chicken's egg.

The wood ducks have been here, producing young in this nesting box installed by the Tulalip Tribes.

This is the first year of a pilot program that will help breeding colonies of two beautiful types of bird, the wood duck and the purple martin, successfully lay and hatch eggs.

In mid-February, tribal staff installed the first nesting boxes. Now, they're finding which of the sites were used by birds and why, laying the groundwork for a future boost to bird populations.

The wood duck breeds in wetlands, while the martin prefers nesting above open water in places like Tulalip Bay, which has the largest nesting population of purple martins north of Everett. Because the birds are colony nesters that seek out sites over water to lay eggs, the bay is well suited to martin reproduction.

"The birds return to this area because they know it's a good nesting area," said Michael Sevigny, wildlife manager with the Tulalip Tribes. "By giving them more sites for nesting colonies, we're hoping to improve nesting productivity in our general area."

Tribal technicians Cortez and Amanda Shelton built five boxes for the martins, placing the boxes on two separate pilings near Priest Point on the Tulalip Reservation near Marysville. They also built six nesting boxes for wood ducks, positioning them at three sites on the reservation.

The tribe plans to build 20-30 more boxes for each of the species this winter, expanding the martin nesting sites and extending the wood duck program further into the Quil Ceda watershed.

"A lot of publicity goes toward tribal work on species like elk and salmon," said Sevigny. "But the goal of the wildlife program is to help enhance all species. Every species has a role to play in a healthy ecosystem."

A wood duck.
Photo: U.S. Fish and Wildlife Service

Of the five boxes intended for martins, at least two have been used by the birds. Additionally, wood ducks nested in four of the six boxes built for them – a real success.

"You always hear about these five- and 10-year plans," said Sevigny. "You've got to think longer term and do all you can to ensure survival of species over the long run. That has always been view of the tribes and that's what we're trying to achieve here." – *J. Shaw*

A male purple martin rests on a bird box near Tulalip Bay. *Photo: J. Shaw*

Fast Facts:

Purple Martin:

At 7 inches in length and weighing nearly 2 ounces, purple martins (*Progne subis*) are the largest North American member of the swallow family.

Purple martins spend the winter in Brazil before migrating north to nest. They are monogamous.

Wood Duck:

The wood duck is one of just a few North American ducks that nests in trees.

Commonly, wood ducks nest near water, often directly over water. After hatching, ducklings jump down from the nest, sometimes from heights of up to 290 feet without injury.

The wood duck is the only known North American duck species that often produces two broods in one year.

Baker River Sockeye

Back From The Brink

The first sockeye harvest of the year for treaty Indian tribes in western Washington is a special one, and not just for the cultural values associated with harvesting these prized fish.

When Upper Skagit tribal members take sockeye from the Baker River, they are fishing on the only natural sockeye run in Puget Sound. The Baker River run represents a fish population that has come back from the brink of extinction to levels that can again support harvest.

"Sockeye are the one of the most important fish species to the tribes," said Scott Schuyler, the Upper Skagit Tribe's policy representative. But the run was almost lost two decades ago. Since then, hatchery production and other mitigation measures have caused the run to swell in size, supporting an annual fishery.

Harlan Sam of the Upper Skagit Tribe smiles over his catch of Baker River sockeye during this summer's fishery. *Photo: J. Shaw*

Two dams, built in 1925 and 1959, changed the face of the Baker River and Baker Lake areas, causing salmon production to dwindle. Continued habitat loss and degradation further pushed the species toward the edge.

But Puget Sound Energy, which operates the dams, is legally obligated to provide mitigation measures that will protect the fish run. An ambitious hatchery production program fish transportation measures have helped the run rebound.

"I cannot describe the feeling of seeing Upper Skagit members harvesting sockeye once again at the mouth of the Baker," said Schuyler. "The largest Upper Skagit village, named 'Sbalikwh,' was located at the mouth of the Baker."

Historically, the run was composed of more than 20,000 sockeye, possibly far more. Those numbers flagged to an average of fewer than 2,000 fish in the 1970s and 1980s. Until the stock rebounded in the 1990s, Baker River sockeye teetered on the brink of extinction. In 1985, fewer than 100 fish returned to the Baker River to spawn.

"It was a real hardship to go without this opportunity to fish," said Schuyler. "But the tribes have always put the future of the resource first, so we chose to stop harvesting until such a time the run was sustainable again."

It has taken extreme measures, though, to reach that point.

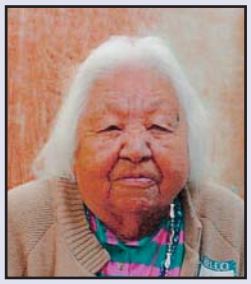
Now, Puget Sound Energy has an elaborate program designed to get Baker River sockeye around the dams, collecting returning sockeye in a fish trap to prepare them for transportation via modified tanker trucks. In these vehicles, transformed to allow water-to-water sockeye transfers, the adult fish are taken to artificial beaches for spawning.

Their offspring are released into Baker Lake, where the juvenile sockeye grow. Later, the young fish are funneled into a pump system near the Upper Baker Dam. Then, the fish are taken via tanker truck below both dams and released. When those fish return, the cycle starts again.

Over the last several years, run sizes have crested at 20,000 fish – comparable to historical levels. That enabled about a dozen Upper Skagit tribal fishermen to open their season with fresh sockeye this year.

"It's been a long road back but we're happy to have a thriving Baker River run again," said Schuyler. "As long as there are fish to catch, the fishermen are happy." – *J. Shaw*

Passages



Katherine Brown Joseph

Katherine Brown Joseph, 91, passed away September 13, 2006 in Arlington. She was born on July 23, 1915 on the Suiattle River to Chief Leo Brown of the Sauk Tribe and Josephine Martin Brown. Katherine was the granddaughter of Chief Jim Brown, of the Sauk, great-granddaughter of Chief Skadewa of the Snoqualmie, Chief Kwulsh Kadim of the Duwamish, Chief Why Pal Kan and Chief Skoleab of the Wenatchee. Her deep and extensive knowledge of tribal histories, genealogies and lifeways remained sharp until her last day.

Katherine attended the Tulalip Boarding School where she learned the English language. Attempts by the government to remove the "Indian" failed and she returned to her people. She was the last fluent speaker of the Sauk language.

Katherine married James Joseph (Lummi/Malahat) and the couple moved, by canoe, to East Saanich, Vancouver Island. They returned to the Indian Hill community in the Sauk Valley to start their family. Children James Lawrence Joseph, Eveline Matory, Josephine Strong, Kenneth, Norma and Leroy Joseph were born there. After moving in 1948 to the Lummi reservation, Katherine Misanes, Nancy DeCoteau, Christine Banks and David Joseph were born.

Katherine was beloved and respected by the Lummi community.

Katherine served a number of years on the Sauk-Suiattle Tribal Council and was active in tribal government for more than 40 years. She helped steer the tribe to achieve federal recognition and the creation of the Sauk Suiattle reservation in the tribe's aboriginal homeland near Darrington.

Katherine Joseph lived a full and exemplary life. She was deeply loved and revered by the many people she touched. She is survived by nine of her 10 children, 22 grandchildren and 11 great-grandchildren.

Chemicals Threaten Salmon Reproduction

To survive, all species need to reproduce. This sounds simple – until chemicals begin attacking the very systems that support this basic need.

Endocrine disruptors are pollutants that disrupt cellular development and reproduction by mimicking or interfering with natural hormones. These chemicals can have serious consequences for fertility, causing abnormalities in the reproductive system. They affect humans and wildlife alike.

Now, researchers at the Stillaguamish Tribe are studying how endocrine disruption may be affecting threatened chinook salmon.

"Any threats to salmon reproduction are serious," said Jennifer Sevigny, a biologist with the Stillaguamish Tribe. "This study will give us invaluable information about what effect endocrine disruption is having on chinook."

Female salmon produce a protein known as vitellogenin to aid egg production. But when male fish are exposed to environmental estrogens, levels of vitellogenin in their blood can become elevated.

"Abnormal levels of this protein in male salmon can be used as a biological indicator for exposure to endocrine-disrupting compounds," said Sevigny. "When we find elevated levels of vitellogenin in a male fish, we can be fairly confident that he has been exposed to endocrine disruptors."

At the Stillaguamish hatchery, staff have noticed a number of sterile adult male chinook salmon. Whether this is related to chemical exposure is speculation at this point. But since endocrine disruptors may affect reproduction even at relatively low concentrations, these chemicals could seriously impact several species in the food web.

The study will test 65 summer run Stillaguamish River chinook.

The term "endocrine disruptor" is defined in several different ways, but generally includes chemicals such as pesticides and fire retardants. It also encompasses "legacy" contaminants that were discharged into the environment decades ago, such as DDT.

Kevin Gladsjo, Stillaguamish tribal hatchery manager, and Kip Killebrew, tribal enhancement biologist, display a Stillaguamish chinook. *Photo: J. Shaw*

Scientists agree that endocrine disruption is a major health issue that affects both humans and animals in the Pacific Northwest, yet very little information exists about how specific chemicals of this nature pose a threat.

"This program will give us valuable data on the effects of endocrine disruption on Pacific salmon," said Sevigny. "Once we get some results, we may set up future work to determine which contaminants are posing the gravest threat."

The project is funded by nearly $12,000 in Coastal Salmon Recovery dollars. – *J. Shaw*

Generations

In the early 1900s, Stillaguamish tribal members direct cedar bolts to a shingle mill downstream on the Stillaguamish River.
Photo: Stillaguamish Tribe

In Hood Canal

Tribe Examines Effects Of Low Oxygen Levels On Crab

Skokomish shellfish technician Steve Ward holds a Dungeness crab like a sandwich, making sure its pincers are out of way of any fingers, while technician Shane Miller gingerly attaches a small neon green tag to the crab's underside.

The process continues for the next several hours, as Ward and Miller, working beside Washington Department of Fish and Wildlife (WDFW) staff, collect data on each of the 144 crab collected and released that day near Scenic Beach.

The tribe has been tagging crab since April as part of an effort to learn if Hood Canal's low dissolved oxygen (DO) levels are affecting the health and population of Dungeness crab.

Observations by tribal fisherman and recent studies by WDFW have shown a significant decline in the number of crab caught in the southern portion of Hood Canal – the same area where low DO has been recorded.

"With this study, we want to look at crab distribution and density in relationship to the dissolved oxygen levels in Hood Canal," said Chris Whitehead, Skokomish Tribe's shellfish management biologist.

The tribe, in collaboration with WDFW, has been collecting data and tagging crab in five locations in Hood Canal – Lynch Cove, Lilliwaup, Tahuya, Anna's Bay and Scenic Beach. Water quality monitoring is also being conducted at each location.

Skokomish tribal fisheries technicians Shane Miller, left, and Steve Ward, attach a tag to a Dungeness crab. *Photos: T. Royal*

A tagged Dungeness crab.

So far, few crab have been found in the Tahuya and Lynch Cove areas, places where they are usually abundant, Whitehead said. Pots coming up empty have been typically covered with a black substance that smells like sulfur, or rotten eggs, he added.

Anyone who catches a tagged crab is asked to contact the tribe's fisheries department at (360) 877-5213 or WDFW at (866) 859-8439. So far, more than 70 have been reported. – *T. Royal*

Co-Managers: Moving Elk Herd Is Best Solution

Relocating the Sequim-Dungeness elk herd to a landscape that offers a variety of habitat better suited to the needs of these wild animals is necessary to ensure the long-term health of this population, the Jamestown S'Klallam Tribe and the state's Department of Fish and Wildlife have determined.

The Wynoochee River valley on the southern Olympic Peninsula is known as a place where elk thrive, and, following several years of research, the tribe and the state, the herd's co-managers, are recommending moving the herd there.

As development in Sequim has exploded in the past decade, the natural behavior of the 70-head elk herd has been altered. The wild animals are foraging on valuable farm crops and appear content living in the quickly urbanizing landscape. The tribe does not believe the current situation is beneficial for the long-term health and security of the herd, said Kurt Grinnell, a Jamestown S'Klallam Tribe councilman.

The preferred option entails capturing the elk that reside north of Sequim via corral traps and moving them to the Wynoochee River valley, in east Grays Harbor County. In exchange, an equal number of elk from the Wynoochee River valley would be relocated to the Snow and Salmon creek drainages, located about 20 miles east of Sequim.

The extra effort to bring elk back to the Snow and Salmon creek region will help maintain a healthy and genetically diverse elk population in the northeast corner of the Olympic Peninsula.

Following relocation, the co-managers would make efforts to ensure the new herd in the Snow-Salmon creek basin is managed effectively and monitored closely so not to cause the same problems that happened in Sequim.

"The tribe believes the elk will have a better future in a location that provides them with natural forage, migration corridors to both high and low elevations, calving areas and opportunities to encounter elk from other herds," said Grinnell.

After receiving considerable public input on the proposal, a final determination is expected early next year. – *T. Royal*

Oil Spill's Legacy: Tribe Marks End Of 15-Year Cleanup

The delicate olive shell used for centuries in Makah tribal regalia disappeared from Neah Bay beaches for years after 100,000 gallons of fuel oil from a sunken ship fouled the shores from Neah Bay to Oregon in 1991, killing the mollusk that inhabits the shell.

"So many of our cultural and natural resources were impacted," said Vince Cooke, environmental division manager for the tribe. Cooke attended a recent ceremony in Neah Bay hosted by the Makah Tribe that marked the end of a 15-year, multi-agency restoration effort following the spill from the fishing vessel Tenyo Maru.

"Thousands of seabirds died. The kelp beds that are so important to young fish were damaged as well as all kinds of inter-tidal life. Seafood harvesting was shut down for months," said Cooke. More than 4,000 bird carcasses representing 30 species were collected, although thousands more died or were impacted over time.

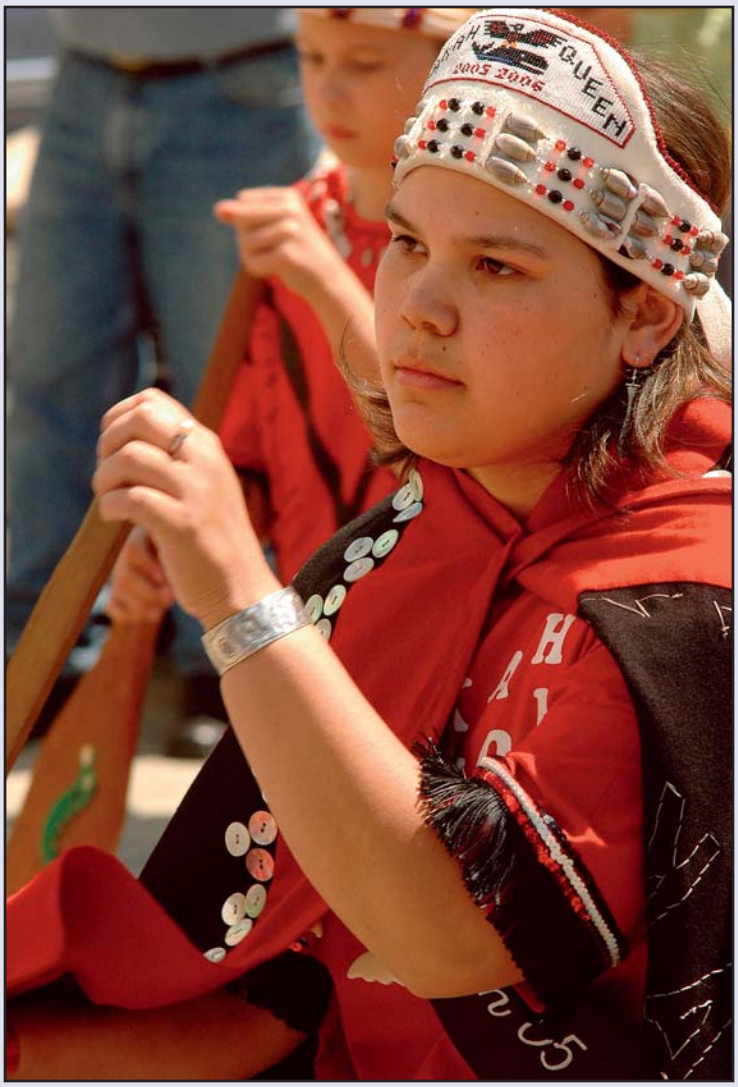
> **'We must prevent future spills from happening.'**
>
> *– Vince Cooke*
> *Environmental Division Manager,*
> *Makah Tribe*

To prevent future spills, the tribe worked tirelessly to convince state and federal legislators to fund a rescue tug stationed in Neah Bay year-round to prevent future spills. Today, there is a rescue tug in Neah Bay, but only during the winter months. "It is critical that we get that tug here year-round," said Don Johnson, Makah tribal chairman at the time of the spill. "There were 10,000 vessels a year entering the Strait of Juan de Fuca in 1991; now there are 15,000 to 20,000."

"We must prevent future spills from happening," said Cooke. "Out of this disaster, we gained a seat at the table where decisions are made to improve oil spill prevention. We also have tribal crews trained to respond to spills as well as some basic equipment that is a stop-gap until state and federal agencies can respond.

We have to be vigilant and maintain our seat at the table to protect our resources and our way of life."

Meanwhile, the olive shell and its mollusk inhabitant can again be found on the beaches of Neah Bay and on the regalia of young Makah dancers. Necklaces made from the shells were presented to many of those who participated in the clean up and restoration process at the recent ceremony. "It's a reminder of how long it took for our resources to recover," said Debbie Wachendorf, Makah tribal council member. *– D. Preston*



Nicole Parker, Makah Queen, wears a headdress decorated with olive shells. *Photos: D. Preston*

A dead common murre, one of thousands of birds that died as the result of the 1991 Tenyo Maru oil spill, lies on Shi Shi beach with an oil absorbing boom in the background.

Makah Set Aside Land To Help Marbled Murrelet

A marbled murrelet sitting in its nest. *Photo: Tom Hamer, U.S. Fish and Wildlife Service*

About 10 percent of the marbled murrelet population along the Washington coast died as the result of the 1991Tenyo Maru oil spill. That makes the Makah Tribe's set-aside of 555 acres of murrelet habitat crucial to the bird's continued survival.

"I can't emphasize enough how important that kind of quality habitat is to the future of the murrelet," said Kevin Shelley, senior biologist for the U.S. Fish and Wildlife Service. The marbled murrelet is listed as threatened under the Endangered Species Act. The robin-sized sea bird survives by feeding in the ocean, but nests up to 50 miles inland in old-growth trees.

The murrelet's decline has been linked to dwindling old growth forests.

That kind of critical nesting habitat is found in the 555-acre tribal land set-aside and an additional 345 acres purchased near Willapa Bay that is administered by the U.S. Fish and Wildlife Service. The 900 acres of conservation easements and purchased lands were paid for with $4.7 million from a reparation fund established after the spill.

Surveys of murrelets in the past two years have revealed a disturbing trend of low reproduction. "Murrelets lay only one egg each year and not all pairs reproduce," said Shelley. No young were seen in at-sea surveys off the Washington coast in 2005 and poor reproduction is expected again in 2006.

"If the bird is going to recover in Washington, it's going to be through key areas like the Makah set-asides where we know birds return each year to nest and have done so for hundreds of years," said Shelley.

– D. Preston

Tribe Cuts Chinook Harvest Despite Record Return

Despite a record run of hatchery chinook returning to the Nisqually River this year, the Nisqually Tribe closed its fishery two weeks early in an effort to increase the number of natural spawning salmon in the upper watershed.

"This is a conscious choice by the tribe to contribute to the recovery of this run," said Georgianna Kautz, natural resources manager for the tribe. The in-season run update for Nisqually River chinook estimated a run of 60,000 fish. The next highest year on record was just half that.

Sport fishermen will be targeting only chinook produced at one of the tribe's two hatcheries.

Joe Sanders, a Nisqually tribal fisherman, hoists a freshly caught hatchery chinook salmon. *Photo: E. O'Connell*

Even though the tribal and state co-managers have consistently met chinook spawning escapement goals in recent years, the tribe and state want to put even more chinook onto the spawning grounds to further build the run. In the last few years, about 3,000 chinook have spawned in the Nisqually, an increase from only 400 more than a decade ago. "We're expanding chinook habitat throughout the watershed and we want more chinook to make use of that habitat," said David Troutt, natural resources director for the Nisqually Indian Tribe.

Because the native wild chinook population was wiped out by over-fishing, and poor hatchery and hydroelectric practices in the 1950's, all chinook in the Nisqually today – both hatchery and naturally spawning – are descendents of hatchery chinook. "Our strategy is changing from trying to pass any type of fish, whether hatchery or naturally spawned, into the upper watershed," said Troutt. "Now we want to see more naturally spawning fish up there so the population can be self-sustaining."

More fish swimming upstream to the spawning grounds also means more fish making it back to the tribe's two hatcheries. "It is hard enough, even during a good year, to spawn the chinook that come back," said Kautz. This year the tribe is seeking additional help from volunteers and from soldiers stationed at Fort Lewis, where the tribe's Clear Creek hatchery is located.

Changes in the fishery compliment chinook habitat restoration and protection throughout the entire watershed. "It would be pointless to allow more fish into the spawning grounds if there was not enough room for all those fish to spawn and their offspring to grow," said Troutt. Just this year, major habitat restoration efforts have expanded estuary habitat near the mouth of the river and spawning and rearing habitat on a major tributary.

"From constricting fisheries to bringing back important salmon habitat, the Nisqually Tribe is doing its part to restore Nisqually chinook," said Kautz. "This year's return is looking good, but we have a lot of work to do before we really recover Nisqually River chinook." *– E. O'Connell*

Colorful Tags Aid Hoh Tribe Coho Research

The Hoh Tribe is using an innovative new tracking approach to find out where thousands of tiny young wild coho go to survive the winter in the Hoh River watershed.

A young coho is measured following injection of an innovative orange tag seen in its lower rear fin. *Photos: D. Preston*

"We know general information about adult coho returns from the use of coded wire tags," said Tyler Jurasin, fisheries biologist for the Hoh Tribe. The tiny millimeter-long tags are inserted in the nose of young salmon to provide information about migration and survival rates. The tags are recovered during tribal and non-tribal fisheries in the ocean and river when the fish return as adults.

"With this new tagging technology, we will know exactly where young coho spend their time in the river and where they move between summer and fall," Jurasin said. "Understanding these movements and fish use of these different habitats will allow us to prioritize habitat restoration projects. We'll also get a better handle on winter survival."

Beginning in late August, Hoh tribal fisheries crews used small seine nets to capture young wild coho and inject a rubbery substance in the fish's anal fin before being released back to the stream. The mark, known as a visual implant elastomer, can be made into many colors to indicate exactly where the coho were captured. Barely detectable with the naked eye, the mark is fluorescent and shines brightly under an ultraviolet light. Tests have shown the mark does not harm the fish.

"It's really going to help us see what habitats the fish prefer in the winter," said Will Hudson, fisheries technician and Hoh tribal member.

The fish will be recaptured this fall to determine where they've traveled to spend the winter after being marked. "Once we've established where different groups are in the fall, we'll recapture them in the spring to get a better idea of winter survival and to predict adult returns. Over the years, we'll also see how fish change their habitat use when water levels are lower or higher."

Hoh tribal fishermen rely on the coho fishery to provide food and income in the fall and winter.

This recent trapping and tagging of coho is the first by the tribe since the 1980s. Since then, there has been significant loss of coho habitat due to forest practices and flooding.

"The information we're gathering may allow us to better predict returns by giving us more information on the juvenile coho life cycle and it will aid us in prioritizing habit restoration projects," said Jurasin. "We have a long list of habitats where we want to mark fish over the years." – *D. Preston*

Joe Gilbertson, center, fisheries biologist for the Hoh Tribe, transfers young coho into a bucket on Owl Creek while fisheries technicians Daki Fisher, left, and Will Hudson, right, hold the net. The fish are tagged and released.

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