

"THE SALMON DANCE ON ITS FIRST ARRIVAL"

Yil-me-hu

WINTER 2015/2016



THE NISQUALLY WATERSHED SALMON RECOVERY NEWSLETTER | WHAT'S INSIDE:

Nisqually Delta Restoration Project Celebrates 5 Years of Monitoring
Phase III of Ohop Restoration Completed
Mitigating Poor Stream Conditions with Active Management

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Cover photo: Drought impacts captured at Alder Lake. Photo by Jed Moore.

Nisqually Indian Tribe



Natural Resources Department

Nisqually Indian Tribe Natural Resources Department

12501 Yelm Hwy SE
Olympia, WA 98513

Phone: 360-438-8687

Fax: 360-438-8742

Email: vonessen.ashley@nisqually-nsn.gov


Websites:

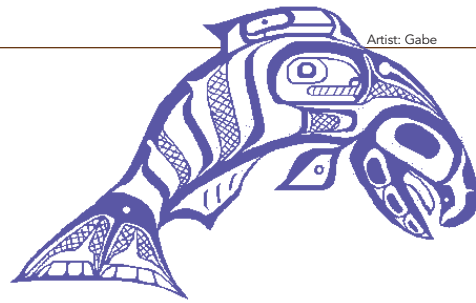
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Managing Editor: Ashley Von Essen

Writers/Editors: Rene Bracero, Christopher Ellings, Morgan Greene, Justin Hall, Jed Moore, Sarah Moorehead, Emmett O'Connell, Cathy Sampsel, Bill Simper, David Troutt, Ashley Von Essen, George Walter, Sheila Wilson

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Yil-me-hu

Yil-me-hu, Nisqually word that means "the salmon dance, on its first arrival."

The first fish ceremony — The first fish caught in the spring was prepared in an earth pit stove, shared and eaten by members of the village. The bones, left intact, were returned to the river, pointing upstream. This display was symbolic. It meant that the villagers were respectful to the fish spirits and wished that, because the ceremony had been done correctly, many more fish would come up the stream during that year. A dance followed the ceremony called the "yil-me-hu," a Nisqually word that means "the salmon dance, on its first arrival."*

* Carpenter, Cecilia Svinth, Fort Nisqually: A Documented History of Indian and British Interaction. A Tahoma Research Publication. 1986. p13.



Photo by Jim Sykes

This edition of Yil-me-hu is dedicated to **Don Perry**, who passed away November 2015. Don was the Nisqually Indian Tribe's Salmon Recovery Outreach Coordinator for many years, implementing programs such as the Nisqually Stream Stewards and the Nisqually Salmon Watchers. He was also the editor of this publication. He touched many lives along his journey and has made a real difference for the Nisqually Watershed. He will be missed.

*I will know and become the wind when I die
And like the wind,
The memory of me will always touch you within
So when that sad day comes and makes you cry
Hold back your tears and remember
What a good friend I had been*

— David Stepetin

Yil-me-hu is published by the Nisqually Indian Tribe Natural Resources Department and the Nisqually River Council to provide information about activities associated with the protection and restoration of salmon and their habitat in the Nisqually watershed.

If you wish to no longer receive this publication, please contact: Ashley Von Essen, vonessen.ashley@nisqually-nsn.gov.



David Troutt

David is the Natural Resources Director for the Nisqually Indian Tribe, Chair of the Salmon Recovery Funding Board, Chair of Puget Sound Salmon Recovery Council and Chair of the Nisqually River Council.

The news lately has been filled with information about our quickly and dramatically changing climate. From the recent drought to wildfires, from spring flooding to poor snowpack, we are seeing things change rapidly. For example, we have measured the highest temperatures in the adjacent ocean waters ever recorded.

What was once a "blob" of warm water off the Gulf of Alaska, expanded this past spring and summer to reach from the Aleutians to the equator. The resulting impacts to the ecosystem include shifts in zooplankton communities and visits from tropical predators. These impacts are not well understood but we are seeing a glimpse of these changes through the eyes of our salmon.

When we reflect back on the 2015 Nisqually River salmon runs, hopefully we consider them to be anomalously low. Pink salmon were projected to return in excess of 1 million based on incredible smolt production in 2014, yet less than 200,000 made it back to the river. That still seems like a lot of salmon and it is, but the survival of a huge cohort of pink smolts was disastrous. The same sad story is holding true for our chinook and coho salmon as well. We forecasted roughly 24,000 chinook, down significantly from our recent average of 30,000+ as a reflection of poor ocean survival, but the actual returns to the Nisqually are around 50 percent of that low projection.

Our canary in the coal mine is gasping for a breath.



A natural reaction to this global, "bigger than us," news is to throw our arms up and be resigned to our fate and our lack of ability to control our future. These are giant issues that will require massive cultural and political shifts by millions of people. Although our awareness is increasing, as a society we are not ready yet to make the necessary lifestyle changes to reduce our ever increasing contributions to the problem.

While we continue to slowly move our nation toward stewardship and responsibility, the old axiom "think globally, act locally" could not be more important than right now, especially for our salmon. Our work in the Nisqually watershed, with all of you and our partners, is most critical when things elsewhere are turning inhospitable. When ocean survival for salmon is high, they can survive through decreases in freshwater productivity. Fewer smolts produced may still mean large numbers of returning adults under favorable ocean conditions, so a road or two here and there, a new bulkhead, or a land conversion from timber or agricultural use to urban uses can be masked and a false sense of security is easy to embrace.

When things get bad, like they are now and may be for the foreseeable future, any loss of freshwater and nearshore habitat function will be magnified in importance to the survival of our salmon. We need to turn our focus towards our home, we need to dig down into our own watershed and fix the things we can control.

Our work to protect and restore the Nisqually watershed, the delta, and Puget Sound, is always important; but, it is perhaps even more necessary and critical under these adverse conditions. The work of the Nisqually Indian Tribe, the Nisqually River Council, the Nisqually Land Trust, the South Puget Sound Salmon Enhancement Group, the Town of Eatonville, City of Yelm, Joint Base Lewis-McChord, Tacoma and Centralia power utilities, and all of our partners is more important now than ever.

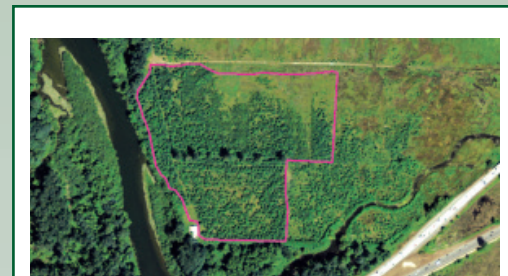
It all goes back to our belief that the Nisqually Watershed is our home, the center of our universe. That idea takes on new meaning for all of us in the face of climate change. We need to treasure, respect, and honor the river, the Sound, and each juvenile salmon and steelhead as if their very survival was at stake, because it is.

SALMON RECOVERY PLANTINGS THRIVE

Between 2007 and 2009, over 50 acres throughout Red Salmon Slough (RSS) at the mouth of the Nisqually River were revegetated with 42,000 native trees and shrubs. Between 2009 and 2012, 70,000 plants were installed on 100 acres across the Ohop Creek floodplain. These plantings improve salmon habitat by shading stream channels, contributing woody debris and inputs to the food web, and stabilizing soils. The most challenging stage for a new planting is the first two growing seasons when new root systems have limited access to soil moisture and plants are small enough to be smothered by invasives such as reed canarygrass. Once plantings reach age four or five, they begin to grow more quickly, spread both vegetatively and by seed, and will form a closed canopy in some areas.

Monitoring of the plantings entails on-the-ground measurements of density and percent canopy by species early on. Following the first few years, the plantings are monitored using remote sensing techniques. Aerial images such as those obtained through the National Agriculture Imagery Program (NAIP) are analyzed in ArcGIS through a supervised classification process that assigns each pixel of an image to a vegetative class (such as 'trees and shrubs' or 'pasture grasses') to obtain percent canopy of the planting. At the Ohop planting, wetter portions of the site are exhibiting 40% canopy cover. Being slightly older, the RSS planting is exhibiting 65% canopy cover in places. Faster growing species such as black cottonwood are reaching heights of over 130' at both sites.

Increased tidal influence due to dike removal has resulted in portions of the RSS site becoming too salty over time to support woody vegetation. Other loss of plants has been due to deer and elk browse and rubbing. Monitoring at Ohop has documented a rapid increase in the number of beavers present over the last year and cottonwood are among the species beavers most prefer. While beaver are doing a number on some of the trees along the channel, the planting was installed at a high density to allow for some losses due to wildlife browse. Beavers are a natural and desirable component of the ecosystem – beaver dams



2013 NAIP aerial image of RSS planting canopy (above) and classified raster with planting in green and pasture grasses in orange (below).



Maps by Cathy Sampsel

create pools, wetlands and sloughs that ultimately diversify and improve salmon habitat.

Annual site visits inform adaptive management plans as the plantings evolve. The sites will continue to be maintained and supplemental weed control will be conducted as needed. An underplanting of shade tolerant conifer species, such as western red-cedar and western hemlock, is planned for this winter in portions of the Ohop site.

Five year old portion of the Ohop planting.

Photo by Cathy Sampsel

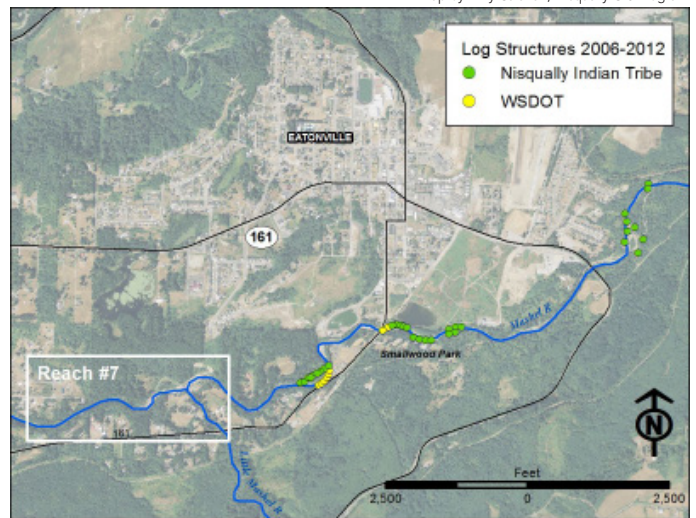
Restoration Continues in the Mashel Basin

Known for its timber production, the upper Mashel Basin has been site to logging and other timber-related activities for many years. Not only have legacy effects of past logging practices limited age of existing stands, but have greatly decreased the input of large wood into the Mashel Basin. The hardening of banks and introduction of logging roads have lead to unstable slopes, increased erosion, and introduced more fine and large sediments into the system. For ESA-listed Chinook salmon and steelhead, this means their habitat is less diverse, in-stream flows are much quicker and less predictable, and they have fewer places to rest and feed.

To reduce these effects, watershed partners have taken to installing a number of engineered logjams (ELJs) on the Mashel. These large structures, paired with riparian plantings of native trees and shrubs, have not only added more wood to the system, but have improved channel stability and complexity and decreased the amount fine sediment moving through the system. ELJs also create pools, add cover for shade, and sort gravel needed for spawning salmon.

Since breaking ground in 2006, 43 ELJs have been installed in the Mashel River. Over the next few years, the South Puget Sound Salmon Enhancement Group and the Nisqually Indian Tribe intend to install up to a dozen more. Along with the introduction of ELJs, over five acres of riparian plantings will be installed to aid in revegetation of the area, creating more habitat and wood that someday will contribute to making natural features. Estimated to cost just under \$1.5 million, this large-scale effort will improve habitat near the confluence of the Mashel and Little Mashel Rivers. A grant application for funding from the Salmon Recovery Funding Board and Puget Sound Acquisition and Restoration Fund has been submitted by these organizations to cover a majority of these costs.

The Mashel River before and after the removal of riprap and placement of log structures.



Locations of ELJs installed as part of past restoration projects. Reach 7 demonstrates the intended location for the project's upcoming phase.

Photo by Christopher Ellings



An underwater shot gives evidence that salmonids use the deep pools that have formed to rest and forage for food.



Photos by Florian Leischner

Underwater Camera Provides New Information on Nisqually Salmon

Early this year a fish counting camera was installed in the Nisqually River. The counter camera is an exciting new way to observe and count many of the fish species that migrate through the Nisqually River. Located at river mile 26 in the fish-passage ladder of Centralia City Light's Yelm Hydro Project, the counter camera is operated by the Nisqually Indian Tribe in cooperation with Centralia City Light.



Coho and steelhead are among those being captured as they migrate up river.



Photo by Jed Moore

The counter camera uses an underwater camera and two arrays of infrared light to produce video clips and silhouette images

of fish moving through the fish-passage ladder. The infrared arrays work together to determine which direction the fish is moving, generate a silhouette of the fish, and provide an estimated size of the fish. Two rows of underwater LED lights illuminate the fish in order to provide high quality images and video. The infrared silhouettes are especially useful when poor water clarity decreases the quality of the video.

In less than a year of operation the counter camera has already provided a great deal of new and useful information regarding Nisqually River steelhead, coho, chum, pinks, and Chinook. Several previously unknown pieces of information include: the full extent of the coho and chum runs; the abundance of adult steelhead above the counter camera; and better estimates of coho abundance. In the future the counter camera will make it possible to provide annual estimates of juvenile steelhead to adult survival, and other important population information. Additionally, the counter camera information will be used to monitor the response of steelhead, coho, and Chinook to the habitat restoration efforts in Ohop Creek and the Mashel River.

The counter camera (left) as it sits in the fish-passage ladder of Centralia City Light's Yelm Hydro Project (below).



Photo by Jed Moore



Mitigating Poor Stream Conditions with Active Management

Biologist Jed Moore installs in-stream temperature monitors.

— George Walter, Nisqually Indian Tribe Environmental Program Supervisor

For over 35 years I have worked on Nisqually River environmental issues; the 2015 summer flow and stream temperatures were the worst I've seen. First, there was very little snow pack in the upper watershed. Snow, most years, acts as a natural storage reservoir, holding winter precipitation and releasing it slowly in the spring and summer. But not this year.

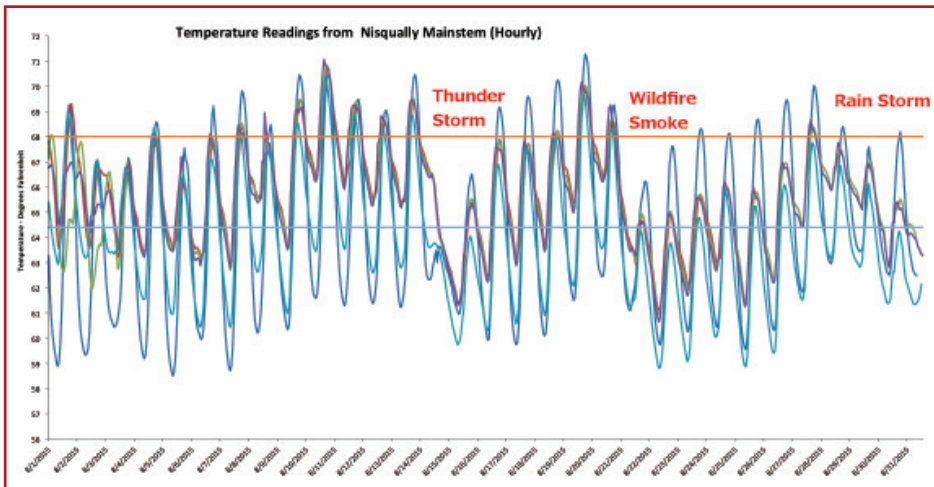
Also, stream temperatures were very warm – up to 70°F at some locations. These high temperatures posed a substantial threat to the salmon returning to the Nisqually River. Thousands of Chinook and pink salmon returned to the river to find nearly uninhabitable conditions. Warm water impacts salmon in many ways such as inhibiting migration, increasing vulnerability to predators, and promoting diseases that can kill salmon before they spawn.

On the Nisqually, we narrowly avoided a salmon catastrophe because the natural resource and hydroelectric managers communicated clearly about the impending threat and then took

steps to reduce the risks. Tacoma Power and Centralia City Light (the two Nisqually hydroelectric projects) agreed to a flow management regime that kept more water in Tacoma's Alder reservoir, putting off the time when there is no water left in the reservoir to supplement flow and moderate temperatures.

Centralia even agreed to cease operations completely for the months of August and September. This utility has the "water right" to force Tacoma to release extra water, and to divert water from the river. However, Centralia officials recognized that no one benefits from salmon dying before spawning and therefore they shut down. I cannot over-emphasize how impressive this action is – a utility gave up its right to generate power in order to protect the Nisqually River and its salmon.

The Chinook salmon runs of 2015 were some of the worst on record. However, the runs were given a fighting chance to migrate up the river and reproduce successfully due to bold actions taken by natural resources managers in the Nisqually River.



A nearly empty Alder Lake reservoir.

Photo by Jed Moore

The horizontal lines on this graph represent the temperature window needed for viable salmon populations. Above the orange line represents temperatures unsuitable for survival.

PHASE III OF OHOP RESTORATION COMPLETED

Photo by Cathy Sampsel

The Ohop Creek restoration project took a major stride forward this summer with the completion of Phase III. Building on earlier, upstream phases that restored over a mile of ditched stream channel and revegetated 100 acres of floodplain, Phase III tackled the downstream end of the degraded reach. This newest phase results in another 1.4 miles of remeandered channel and includes spring-fed backwater alcoves and over 50 engineered log jams that will provide rearing habitat and refugia for salmon.

Revegetation of the Phase III floodplain is ongoing. Last year, 25 acres were planted with native trees and shrubs. Community and school group planting events involved over 730 volunteers and installed 2,500 plants! The remainder of the planting was installed by the Tribe's crew of restoration technicians along with help from the Nisqually Land Trust, the Nisqually River Education Project and the South Puget Sound Salmon Enhancement Group. Despite a punishing summer drought, the majority of the planting is showing good survival and establishing well. An additional 50 acres will be replanted across the next two years. Visit ohopcreek.org for more information.



Volunteers help plant thousands trees in the Ohop Valley.

Fish salvage operations relocated an estimated 12,000 organisms into the newly formed channel.



Photo by Candi Tobin

A view from above.



Photo by Cathy Sampsel

Photo by Jed Moore

TOTALS

2.4 miles
of channel
restored

50% increase
in stream habitat

92,000 plants
installed so far

Installation of an engineered log jam.





Nisqually Delta Restoration Project Celebrates Five Years of Monitoring

Scientists used beach seining to capture juvenile salmon in the Nisqually Delta. The presence or absence of fish was useful in determining the extent to which juvenile salmon are using the restored area.

Photo by Jan Wieser

In 2009, 4 miles of dikes along the perimeter of the Nisqually Delta were removed to restore tidal influence to the area. The project was the largest of its kind in the Puget Sound, and was a crucial step to restoring estuarine habitat in the region. For the last five years, the Nisqually National Wildlife Refuge (NNWR), the Nisqually Indian Tribe (NIT) and the United States Geological Survey (USGS) have completed in-depth monitoring to track the recovery of the river delta. The monitoring has recorded changes in the estuary and nearshore environments, in geomorphology and sedimentation, and in vegetation, fish, and birds. In honor of the five-year anniversary of monitoring, here is a glimpse at two of the biggest takeaways.

MOUNT RAINIER INFLUENCES DELTA RECOVERY

The Nisqually Glacier carves into Mount Rainier, loosening sediment that is carried by the Nisqually River. The majority of that sediment is trapped by Alder Dam; as a result, the river contains very little sediment when it spills into Puget Sound, limiting the amount of material deposited on the Delta. After a century of farming, the land on the Nisqually Delta had been compacted and worked, lowering its elevation. The low elevations directly influence the growth of new vegetation communities, because many sites are covered by tidal water for longer than plants can tolerate. Because vegetation has been slow to colonize the Delta, invertebrate populations have also been slow to recover in certain areas. Invertebrates are at the bottom of the food chain for many animals, including fish and birds.

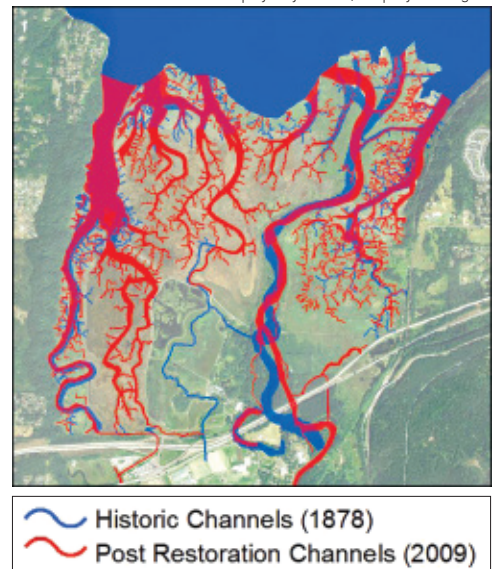
The problem becomes even more serious when looking into the future. Sea levels are rising in Puget Sound and without increased sediment loads, the Delta is threatened by more frequent inundation, which will impact the whole ecosystem. The Nisqually Indian Tribe is examining ways to overcome the lack of sedimentation in order to prevent a loss of Delta habitat.

NISQUALLY SALMON STAND TO BENEFIT FROM INCREASED HABITAT AND PREY AVAILABILITY

Chinook salmon depend on the estuarine environment as they transition from the freshwater to salty Puget Sound. Scientists studied the species response to restoration by monitoring available habitat, prey capacity and fish growth rates.

Researchers found that salmon took advantage of increased habitat availability immediately as the restoration construction completed. Additionally, monitoring has shown that the increased restoration area supports more food for salmon and they have faster growth rates now than they did prior to the restoration. This suggests that salmon, especially Chinook, are benefiting from the Nisqually Delta Restoration, even though full habitat recovery is yet to come.

Map by Amy Calahan, Nisqually GIS Program



RESTORATION BY THE NUMBERS

Almost **1,000 acres** restored on the Nisqually Delta

Yielded a **50% increase** in potential salt marsh habitat

Reconnected **over 21 miles** of historical channels

To learn more about this project and for a list of references, please visit the project's new website:

deltarestoration.nisquallyriver.org.

Ecosystem Services Pilot Project on Lake St. Clair

The Nisqually River Council has made the protection of ecosystem services a priority in its efforts to preserve the Nisqually Watershed. Ecosystem services are the benefits people obtain from the natural environment, such as clean air, clean water, and food. They also include flood and disease control and a variety of spiritual, recreational, and cultural benefits.

A study completed by the non-profit Earth Economics determined the value of the ecosystems services currently being provided by the watershed is between \$288 million and \$4.2 billion worth of services annually. Estimating the value of ecosystem services is an imperfect science, however it is clear that the Nisqually watershed provides a significant amount of services to the region. The Nisqually River Council has now moved forward with the first project aimed at protecting these incredibly valuable services.

The Nisqually River Council, Nisqually Land Trust, Northwest Natural Resources Group, and the Washington Environmental Coalition helped broker a pilot project between the Nisqually Indian Tribe, City of Olympia, and an adjacent landowner to protect one of the last undeveloped and forested large parcels on Lake St. Clair. The Tribe now owns a portion of the property, while the City of Olympia purchased an easement because of its importance to Olympia's drinking water resources at the McAllister well-field and McAllister Springs. In addition to protecting these services, the Tribe will use the site for low-impact cultural activities including canoe training for tribal youth and harvesting non-timber products.

The Nisqually River Council hopes to build on this pilot project by encouraging local governments and private businesses to help pay for the ecosystem services that they depend on.

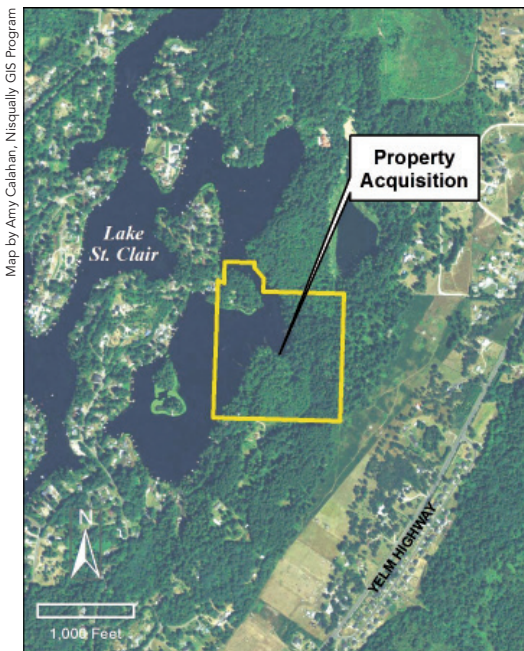
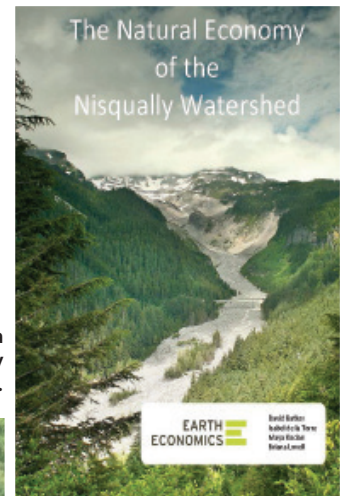


Photo by Joe Kane

The City of Olympia has purchased a conservation easement protecting the McAllister well-field in perpetuity.

"It is clear that the Nisqually watershed provides a significant amount of services to the region."

In 2009 Earth Economics published a report valuing the natural economy of the Nisqually Watershed.



Map by Amy Calahan, Nisqually GIS Program

Lake St. Clair Property Map



Photo by Joe Kane

NEW INTERN TAKES ON SALMON CAMP PROGRAM

My name is Rene Bracero and I am 22 years old. I am the new intern for the Nisqually Environmental Team (NET), a program of the Tribe's Department of Natural Resources (DNR). I am currently a full time student at Northwest Indian College, working towards an Associate of Arts degree. My goal is to get my Bachelors of Science in Marine Biology. Before I had the opportunity to intern at Natural Resources, I was a gas attendant for Nisqually Markets and a helper fisherman for Albert "Chief" Squally. I am also a new father. My hobbies are fishing, hunting, and spending time with my new family.

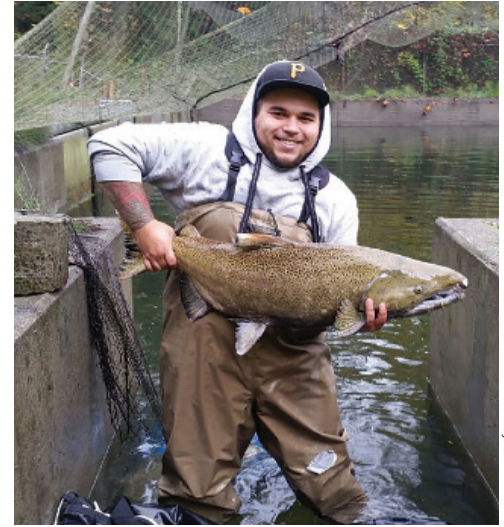


Photo by Walker Duval



Photo by Rene Bracero

My experiences include participation in the following programs:

- Nisqually Field Technician Crew
- Kalama and Clear Creek Hatcheries
- The mainstem weir
- Nisqually Shellfish Program
- She-Nah-Num Seafoods
- First aid/CPR training and oxygen administration with Marine Services
- Nisqually Salmon Camp
- Nisqually Elders program

One of my most recent projects was assisting with the Nisqually Salmon Camp, an educational program designed to educate Tribal youth about the cultural and natural systems that define the Nisqually watershed's geography and to expose students to different natural resources job opportunities.



Photo by Rene Bracero

"We need to have our youth involved right now to get a better understanding of what is at stake, what we can lose if we don't make a change."

Students assisted and participated in research studies on the waters of Puget Sound and in the Nisqually River, and were involved with field work in the restoration zones. Students gained a better understanding of our treaty rights with fishing, how to identify marked salmon from unmarked salmon (natural from hatchery), became familiar with the Tribe's salmon recovery projects, and the salmon lifecycle.

Issues surrounding climate change were also worked into this year's course. Our people are noticing differences in everyday life with salmon harvesting, berry picking, and the list goes on. As a young Indian man I realize that our young people may be left with limited or no Natural Resources! We need to have our youth involved right now to get a better understanding of what is at stake, what we can lose if we don't make a change. Young people need to get involved as soon as possible. There are a lot of unknowns in natural resources which is why we have NET Salmon Camp, helping communities get a better understanding of what DNR is all about.



Photo by Rene Bracero



Photo by Karelina Resnick

The CAC touring the counter camera at Centralia City Light's Yelm Hydro Project.

NRC Citizens Advisory Committee Carries Momentum into New Year

The Citizens Advisory Committee (CAC) of the Nisqually River Council dedicated its energy in 2015 to strengthening membership. The group welcomed three new members to their ranks, and developed a list of goals that reflected the interest of individuals.

Under that guidance, the group successfully brought two proposals, development of a Nisqually Youth Council and a Nisqually Emeritus Board, to the Nisqually River Council for approval. The Nisqually Youth Council will increase the amount of youth representation on the Council while educating local teachers and students about sustainability issues. Similarly, the Emeritus Board will provide a platform for retired NRC representatives to remain connected and committed to the watershed.

The CAC expects to have an equally successful 2016. The CAC will use a systems management approach to better understand challenges in achieving sustainability. Additionally, the group will work to develop tools and materials for an education and outreach campaign, aimed at increasing awareness of the Nisqually River Council and Citizens Advisory Committee. More information is available at: nisquallyriver.org.



Nisqually River Council Pursues Sustainability Goals

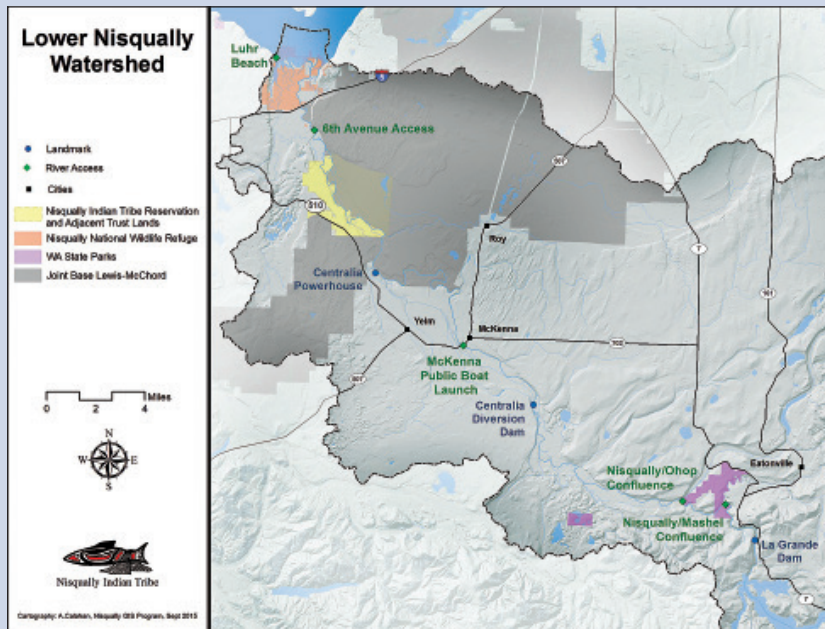
The Nisqually River Council (NRC) had a successful and busy year. In an effort to better accomplish goals, the monthly NRC meetings revolved around topics outlined in the Nisqually Watershed Stewardship Plan (NWSP). The NWSP promotes social, ecological and economic sustainability through eleven different indicators. These indicators provide guidance to existing projects and inspire new ventures.

The largest challenge of the project is reducing the impacts of recreation on threatened salmon species: the areas with the least access contain the largest amount of salmon habitat.

As a result of one such discussion, the NRC launched a planning effort aimed at increasing recreation opportunities on the Nisqually mainstem. The Nisqually River Water Trail, a boating trail, will stretch from below La Grande Dam to the Nisqually Delta, and will provide better access opportunities to the upper stretches of the river. The effort is in collaboration with the National Park Service's Rivers, Trails and Conservation Assistance program and will continue into 2016. The largest challenge of the project is reducing the impacts of recreation on threatened salmon species:

the areas with the least access contain the largest amount of salmon habitat. Despite this challenge, the NRC believes this is an opportunity to share stories about the cultural and natural importance of the river.

In the upcoming year, a major focus will be on strengthening relationships between the NRC and its members. The Council meets on the third Friday of each month; all meetings are free and open to the public. To be added to the mailing list, contact morgan@nisquallyriver.org or visit nisquallyriver.org.

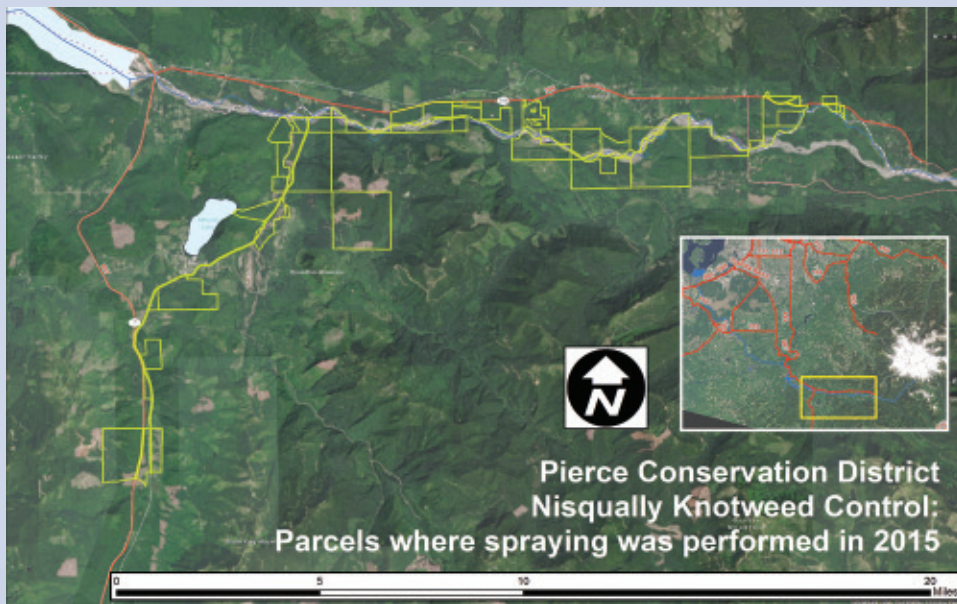


The NRC is in the planning phase of developing a water trail that will run throughout the watershed.



Pierce Conservation District Continues to Battle Knotweed in 2015

Pierce Conservation District performed knotweed control work along a 24 mile section of the upper Nisqually River (upstream of Alder Lake to the border of Mount Rainier National Park) and its tributaries Mineral and Roundtop Creeks. Two crews were involved in the project and treated an estimated 217 acres distributed across 49 properties (see map). The District has been involved in knotweed eradication efforts in the Nisqually watershed since 2010. Staff are currently planning a habitat restoration project in an area where invasive knotweed has been successfully controlled to take place in early 2016. Visit their website for more info: piercecountycd.org.



Map by Bill Simper



Photo by Morgan Greene



Thurston Conservation District Works on Water Quality

This year, Thurston Conservation District hosted a field tour for members of the Washington State Conservation Commission, to educate this key group of policymakers on the area's unique and important natural resources. The discussion focused on the importance of proper farm management, impacts to water quality and shellfish production. Thurston Conservation District and partners also continued their efforts on the Clear Choices for Clean Water Campaign, teaching residents of the Henderson and Nisqually Shellfish Protection Districts how to reduce their impacts to water quality in Puget Sound. Topics included green lawn care, proper pet waste disposal, routine septic system maintenance, stormwater pollution and shellfish. The program also did some focused outreach and education to demonstrate to residents near McAlister Creek the levels of pet waste present in their shared space, inspiring them to keep their park clean. For more details on these projects or to learn more, visit: thurstoncd.com.



Photo by Laura Johnson



Students from Weyerhaeuser Elementary carry their salmon carcass to the Little Mashel River.

Salmon Carcass Tossing — The Stinky, Slimy FUN Way to Start the Year!

Fourteen field trips with 338 students and 56 chaperones were taken to deposit approximately 2,800 salmon carcasses, roughly 28,000 lbs of marine derived nutrients into the upper Nisqually River, Ohop Creek and Mashel River. These marine derived nutrients boost the base of the food web for the next generation of juvenile salmon and benefit 137 vertebrate species—including eagles, coyotes, and other wildlife.

Eye On Nature

Our trained volunteers from Nisqually Reach Nature Center, Friends of the Nisqually National Wildlife Refuge, and The Evergreen State College made this year's program a huge success. A total of 304 students and 53 parent chaperones participated in Nature Mapping, with their data being shared with the citizen science project, eBird. With an ethnobotany walk, Sound Mapping and scientific illustration activities, this field trip aims to foster the next generation of budding naturalists.



Students from Weyerhaeuser Elementary preparing to hit the trails.

Nisqually Nearshore Field Trips

With support and funding from the Nisqually Shellfish Protection District, the Nisqually Reach Nature Center, the National Fish and Oyster Company, and the Puget Sound Restoration Fund, the Nisqually River Education Project was able to bring 529 students from Nisqually Middle School, their entire 7th and 8th grades, out to explore the beach. Students learned the value of the restored estuary, surveyed shore crabs, explored the workings of their local shellfish farm and engaged in problem solving around water quality issues that affect this precious habitat.



Students from Nisqually Middle School survey shore crabs.



Jackie Bulldis participates in Summer Teachers Institute.

All photos by Sheila Wilson

BY THE NUMBERS



HABITAT RESTORATION ON THE MASHEL RIVER

2,000 native trees and shrubs installed
814 student participants
139 parent volunteers



23RD ANNUAL STUDENT GREEN CONGRESS, MARCH 20TH

421 students
29 schools
24 State of the Rivers Sessions
31 afternoon workshop sessions
142 volunteers



WINTER WATER QUALITY MONITORING

February:
41 teachers
36 field sites
928 students
95 volunteers



FALL WATER QUALITY MONITORING

October:
46 teachers
37 field sites
1,153 students
192 volunteers



SUMMER TEACHERS INSTITUTE 2015

39 teachers from NREP, South Sound GREEN and the Chehalis Basin Education Consortium. June 22-24th at the Nisqually National Wildlife Refuge. Tribal, local, and state experts collaborated with teachers on the topics of climate change and biomimicry.

Celebrating the Watershed

Whether it's preserving hundreds of acres of land in perpetuity, breaking ground on a habitat restoration project, or watching a new class of Nisqually Stream Stewards graduate, communities throughout the Nisqually Watershed have much to celebrate. Every year, the Nisqually Indian Tribe, the Nisqually River Council and their many partners share in these accomplishments, celebrating the history, economy, and environment of the watershed.



Photo by Michael Schramm

Photo by Bob Walter



The last Saturday of September, the Nisqually National Wildlife Refuge hosts the Nisqually Watershed Festival. This year the festival turned 26 on the 26th. Plenty of favorite acts and exhibitors returned, including a live raptor show, watching a live dissection of a salmon, storytelling in the Red Salmon Tent, parades through Critter Corridor, and performances by the Nisqually Indian Tribe Canoe Family and the Shooting Stars. New this year was Nisqually Idol, a singing competition where those 18 and under could perform a cover or original piece of music, and the Insect Extravaganza, an exhibit dedicated to showcasing insects from all over the world. As always, the salmon barbeque was a huge hit!



Photo by Sheila Wilson

A few weeks later and little further up the watershed, the third annual Eatonville Salmon Fest went off without a hitch. The Town played host at their own Mill Pond Park and welcomed a number of local exhibitors with hands-on activities for children and adults of all ages. We hope you had a chance to get your face

Photo by Amy Calahan



Painted, make a fish print t-shirt, view a few "stream bugs," and take a tour through the historic Van Eaton cabin. Even FIN The Migrating Salmon made the journey to view pink salmon spawning in the Mashel River and to listen to the local music acts on the main stage.

A great many thanks go out to all the partners that helped plan and contributed to making each of these events a success!



Photo by Michael Schramm

Photo by Bob Walter





Nisqually Stream Stewards Celebrate Another Successful Year

The 2015 Nisqually Stream Stewards graduating class!

This year 22 people from the Puget Sound region successfully completed the training. Even more impressive is that several Stewards had completed nearly half of their 40-hour volunteer commitment before the class ended.

Classes include guest lectures and hands-on training; both are useful for citizen science and other volunteer opportunities. Stream Stewards tested water samples to monitor the quality of the Nisqually River. At Pack Forest, the class measured trees in order to better understand the value of forests. While observing birds at the Nisqually National Wildlife Refuge, the Stream Stewards collected data on 287 individuals, representing 24 species.

"[I] did not know anything about local or state history, how watersheds and forests work, did not know anything about the fisheries or timber. This class was extremely informative as well as fun," noted one Stream Steward volunteer.

Stream Stewards were recognized for their hard work and commitment to the Nisqually Watershed at a graduation celebration on September 26th at the Nisqually Watershed Festival.

Another participant said, "this program is unique and one of a kind. I was happy to be a part of it and will now be a lifelong volunteer of the Nisqually Watershed!"

The Stream Stewards is a free, jointly led program of the Nisqually Indian Tribe and Nisqually River Council aimed at inspiring citizens to conserve the Nisqually Watershed. Over the last decade, the program has inspired many people to be more involved with local organizations such as the Nisqually Land Trust and Northwest Trek. The class is offered annually, with sign-ups beginning in early summer. More information is available at nisquallyriver.org.



Photo by Candra Grimm



Photo by Richard Hanft

Photo by Candra Grimm

Photo by Tyler Willey



Participants had the opportunity to take part in a number of exciting activities, including: visiting the Tribe's mainstem weir, Nature Mapping at the Nisqually National Wildlife Refuge, and touring the University of Washington's Center for Sustainable Forestry at Pack Forest.