"THE SALMON DANCE, ON ITS FIRST ARRIVAL"

Yil-me-hu

SUMMER 2022

THE NISQUALLY WATERSHED SALMON RECOVERY NEWSLETTER

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Cover Photo: A view of Mount Rainier at sunrise.

Photo Credit: Emiliano Perez

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Artist: Gabe

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.

Nisqually Indian Tribe

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DIRECTOR'S CORNER

David Troutt
Director of Natural Resources for Nisqually Indian Tribe

Photo Credit: Christopher Ellings

We all read, almost daily, about climate change and glacial retreat and ocean acidification and other issues that seem almost too big for us to impact. This can lead to frustration and a feeling that there is nothing we can do as individuals to make a difference. I hear this throughout the region and it can be infectious. Apathy leads to inaction which further feeds into the feeling that we are doomed.

Nothing can be further from the truth. In fact, I would argue that now is the perfect time for focused action in our watersheds to combat the global issues that are swirling around us. We can only control what we can control and our backyard is a great place to start.

So rather than throw our hands in the air and complain that the problems are too big and too encompassing and too difficult, we need to double down and get to work improving things where we can. In fact, it might be more important today than it's ever been to act locally in the face of global climate change.

It is imperative for salmon that we continue to press forward on all of our protection and restoration efforts in our watersheds. The fish themselves are battling through climate change and the numerous impacts it is having on their world. As juveniles they are struggling to avoid predators as they make their way from the rivers to the ocean – predators whose numbers are increasing in part due to climate change. Once in the ocean their very survival is linked to finding the right kinds, in abundant amounts, of food to sustain them for one to five years they are growing and maturing before turning their attention to home. Their migration back to the rivers of their birth is also fraught with challenges to their survival and yet they persevere.

Then they enter the rivers to the place that we are all working so hard to protect and restore. In the Nisqually we have returned 90% of the estuary from producing cows to producing salmon. We have protected nearly 80% of the Nisqually mainstem, restored critical portions of Ohop Creek, and installed dozens and dozens of large wood habitat features in the Mashel while promoting the creation of a Community Forest to naturally produce important habitat features for salmon. We continue to seek funding to do big things like elevate I-5 off the floor of the delta to support of the entire lower river, to expand the Community Forest, and to finish restoring the Ohop Valley floodplain. We are also looking at major restoration opportunities in Muck Creek to restore hydrology and habitat for salmon.

We are protecting and restoring the home for salmon so that once they have run the gauntlet of life challenging obstacles the next generation can be safely invested in the clean gravel with cool clean water. In fact, it is highly likely that the reason that Nisqually steelhead and chum salmon have not gone extinct is because of all the hard work that we have all done in the Nisqually. We are combating all those global issues by acting in our backyard. Didn't Sir Paul McCartney once say "think globally, act locally"? We are practicing that approach every day.

So rather than throw our hands in the air and complain that the problems are too big and too encompassing and too difficult, we need to double down and get to work improving things where we can. In fact, it might be more important today than it's ever been to act locally in the face of global climate change. Our work creates refuge for our salmon so that when things improve in Puget Sound and the ocean that our fish will be well positioned to fully take advantage of those improvements. Ready to join us? We have work to do!

Native Plant Restoration: A Long-term Commitment to Recovery

One would think that developing a successful habitat restoration project is a relatively simple task: Step 1: Find location; Step 2: plant native trees and shrubs; Step 3: watch them thrive. If only it was that easy!

When developing a native plant restoration project, great care must be taken to choose species that not only thrived in the area historically, but will survive in current climate conditions. Detailed planting plans are developed to ensure the proper balance of trees and shrubs, as well making sure there are a certain amount of plants per acre. Once this is done, the plants are ordered and delivered from local nurseries, and the fun part can finally begin—the planting! Once in the ground, each planted tree gets its own protective tube which protects it from being devoured by deer, elk, mice, beaver, and other critters that call these sites home.

Photo Credit: Ashley Von Essen

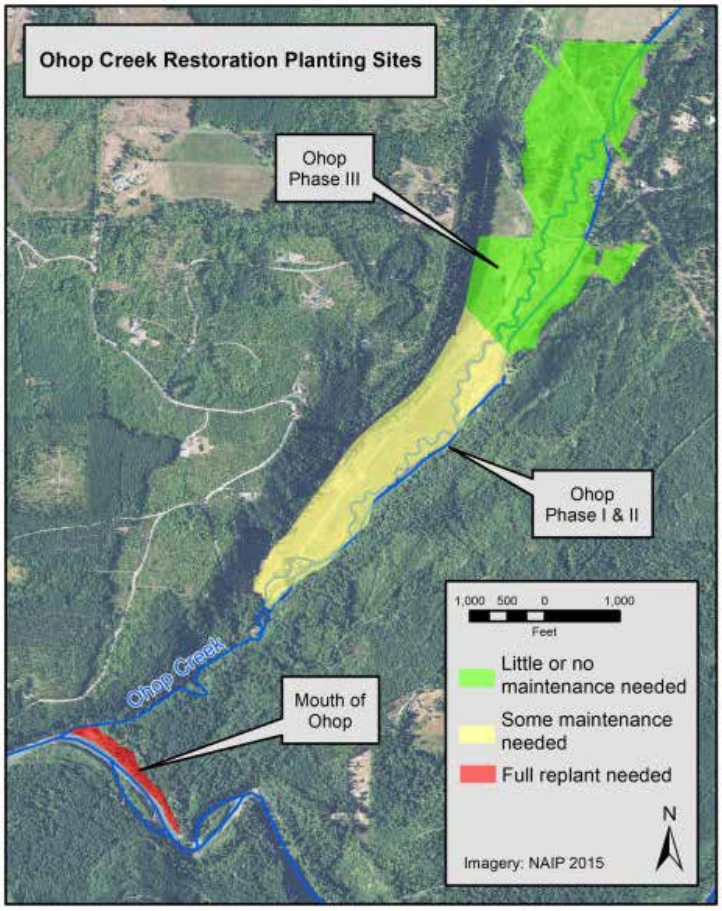
Christopher Ellings, Salmon Recovery Program manager, performs site assessments at each of the past planting sites.

Tree planting volunteer events continue to be a favorite amongst watershed stewards. Each year hundreds of students and adults donate their time to help restore salmon habitat and put thousands of trees in the ground. In addition to our amazing volunteers, there are a number of Nisqually Indian Tribe and Nisqually Land Trust staff that work full-time planning and executing these projects. Since the inception of the Tribe's Native Plant Restoration Crew in 2007, they, along with student and adult volunteers, have put nearly 250,000 plants in the ground!

But what happens after the staff and volunteers go home?

Staff continue to check on the sites regularly, seeing what species survive year to year and provide necessary maintenance. Three to five years after the initial planting, protective tubes are removed when the plants are bigger and stronger, and their survival is deemed more likely. At this time, staff walk away hoping that this new forest is ready to exist on its own.

As part of a project funded by the Environmental Protection Agency, the Nisqually Indian Tribe's Salmon Recovery Program revisited sites that saw restoration as far back as 2007. The goal of the project was to evaluate each of the planting projects the Tribe has helped implement and develop a prioritized plan for future maintenance and planting needs. Salmon Recovery staff completed a number of onsite visits to these restoring areas, assessing the individual needs for each one. Sites were organized by reach, including the Nisqually Estuary, Nisqually River mainstem, the Mashel River, and Ohop Creek. These sites were then color coded to express their maintenance needs: green indicating the sites are able to exist and thrive on their own, yellow indicating that the site is need of some means of maintenance to ensure survival, with red sites in need of extensive maintenance or replanting.



An example of the project's analysis of Ohop Creek and the status of the associated planting sites.

Cartography: Katie Anderson, NIT GIS Program

Observations showed that many of these plants are still thriving, but there are some sites experiencing slow growth and/or poor survival, which can be attributed to changing climate, poor soils, increased animal activity, and encroaching invasive plant species that are inhibiting their ability to survive.

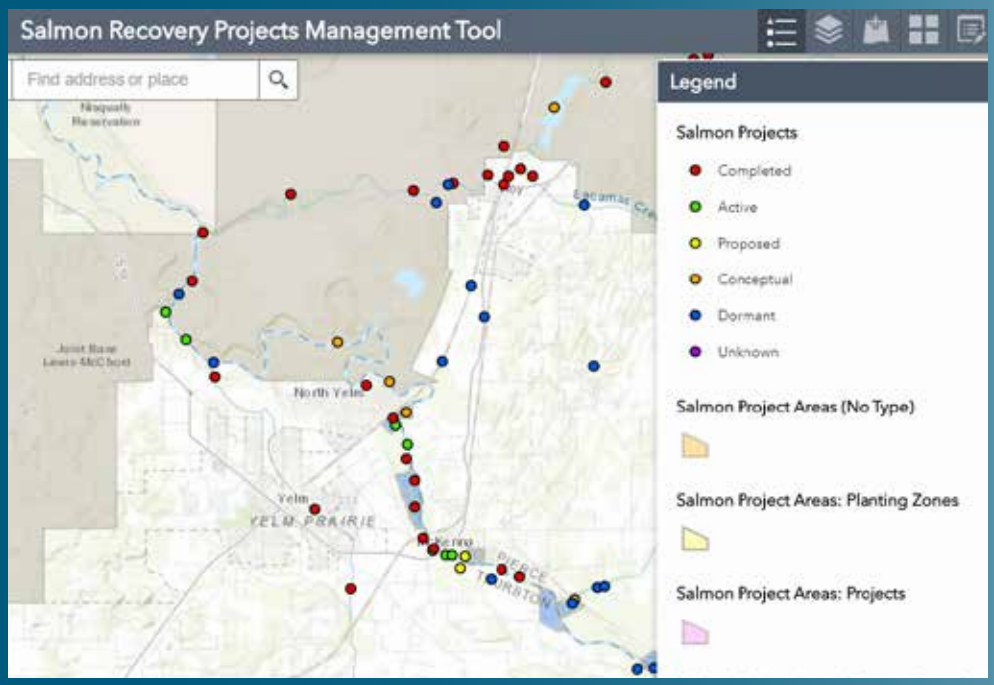
In addition to the field work, staff also performed a desktop analysis which compiled detailed information for every planting for each site. This info was then shared with the Tribe's GIS Program, creating a "Salmon Recovery Projects Management Tool" which houses data for all salmon recovery habitat projects in the watershed, tracking the number of plants installed, maintenance performed, presence of invasive species, etc. The data was also translated into an ArcGIS online mapping application, so it could be easily accessed and added to by watershed partners and stakeholders. This online format will allow partners and contributors to track each individual site, communicate the presence of invasives and record maintenance needs and implementation. The development of this mechanism will allow staff to create efficiencies and better communicate the needs of each individual site.

The Nisqually Salmon Recovery partners are committed to the monitoring and stewardship needed to ensure that every tree planted has its best chance of becoming part of a new watershed forest.

Photo Credit: Cathy Sampselle

2008: The Braget Marsh was initially planted.

2021: An aerial view of the same site, indicating the success of the planting.



A snapshot of the "Salmon Recovery Projects Management Tool," a database that tracks all salmon recovery projects in the Nisqually Watershed.

Cartography: Katie Anderson, NIT GIS Program

Photo Credit: Ashley Von Essen

A site in the Mashel River watershed that appears to be flourishing. Though some maintenance could be performed, development of the understory is underway.

Photo Credit: Ashley Von Essen

Pictured here is a site in the Nisqually's Middle Reach. This site is experiencing tree growth, but struggles with reed canary grass encroachment and is need of continued maintenance.

Photo Credit: Ashley Von Essen

A site that has struggled over the years is what's known as the Braget Knoll. This site experiences direct sunlight with not much shade and encroachment of reed canarygrass and Himalayan blackberry.

Piloting a New Way to Manag

In the late-1800s, settlers converted the Ohop Valley to pastures and farm fields, turning a once meandering Ohop Creek into a straight-flowing ditch to drain the valley for dairy farming. The process drastically transformed the landscape, reducing its ability to provide spawning and rearing habitat for historical salmon populations, including chum, pink, coho, and Chinook salmon, as well as steelhead and cutthroat trout. As a major tributary to the Nisqually, the loss of this habitat was detrimental to these salmon and has contributed to decreased populations and the listing of Chinook and steelhead as threatened under the Endangered Species Act. Substantial work has been done to address the historic habitat degradation, however new science points to another more modern threat to salmon recovery.

Over the past 15 years, watershed partners have worked together to implement the Lower Ohop Creek Restoration Project, transforming the lower section of Ohop Creek and the surrounding valley, converting it back to what it looked like prior to settlement. Completed over two phases of construction, over 2 miles of Ohop Creek have been remeandered, derelict structures and invasive plant species removed, and large woody debris placed throughout the valley floor. As part of the restoration, nearly 200,000 native trees and shrubs have been planted across 180 acres of floodplain.

The restoration of Ohop Creek is a major step in recovering Nisqually salmon, but stormwater pollution that comes of off roadways has been recently identified as a major threat to recovery. Some of the harmful components of stormwater include heavy metals and microscopic tire particles. Traffic volume along Highway 7, which crosses Ohop Creek near the Town of Eatonville, has been on the rise due to population growth of the Puget Sound region resulting in more of these chemicals entering Ohop Creek. According to Washington State's Department of Transportation's 2019 annual average daily traffic data, assuming four tires per vehicle, roughly 12 pounds of microscopic tire particles are released at this site throughout the year. Scientists have recently discovered that these tire dust particles contain a chemical known as 6PPD-Quinone, which causes mortality in salmon, especially coho, in low quantities. The Nisqually Indian Tribe and Long Live the Kings have partnered with Cedar Grove, an environmental solutions company, to pilot a mobile biofiltration system designed specifically to capture and filter stormwater run-off from Highway 7.

Photo Credit: Jack McDermott

Gutter system collecting stormwater run-off from Highway 7.

Photo Credit: Jack McDermott

Water quality monitoring instruments.

e Stormwater in Ohop Valley

Photo Credit: Jack McDermott

Outlet pipes with instrumentation to monitor effectiveness of filtration.

Photo Credit: Jack McDermott

Inlet pipe conveying stormwater into biofiltration compartment.

Photo Credit: Chris Cunningham

In January 2022, the unit was installed between the two bridge crossings along Highway 7, in close proximity to Ohop Creek. The size of the unit allows for the collection of 91% of the roadway run-off. With each significant rain event, the system automatically collects water quality samples at three locations: where the run-off enters the filtration system, the middle of the system, and at the outlet where the water is discharged onto the Ohop Creek floodplain. The water samples allow researchers to test the effectiveness of Cedar Grove's system at removing harmful contaminants. These samples are tested for their chemical and toxicological composition, including heavy metals, ammonia, dissolved organic carbon, total suspended solids, nitrates, nitrites, total phosphorus, and polycyclic aromatic hydrocarbons (PAH's). Additionally, the composite samples are shared with Washington State University to assess biological impacts and University of Washington's Tacoma Campus to test for 6PPD and 6PPD-Quinone.

The biofiltration system is mobile, relatively inexpensive, and scalable for different stormwater filtration needs. If the system can safely remove harmful chemicals and prevent them from polluting salmon streams, don't be surprised if you see the use of this system become widespread. In the very near future, stormwater filtration systems will go hand in hand with habitat restoration as a principle salmon recovery tool.

As of the end of April, the Ohop biofiltration system had encountered two significant rain events and the data analysis is underway. Stay tuned!

Project partners include: Nisqually Indian Tribe, Long Live the Kings, Cedar Grove, Fremont Analytical, Herrera Environmental Consultants, Nisqually Land Trust, University of Washington at Tacoma, Washington State Department of Transportation, Washington State University at Puyallup.

Financial support for this project was provided by: Nisqually Indian Tribe, Puget Sound Stewardship and Mitigation Fund, Royal Bank of Canada, Sustainable Path Foundation, and Washington Sea Grant.

THE NISQUALLY COMMUNITY FOREST CONTINUES TO GROW

In 2014 the Nisqually Community Forest (NCF) was incorporated as a 501(c)(3) nonprofit conservation organization with a mission to establish a working forest in the Nisqually watershed guided by ecosystem-based management and community participation. Since the establishment of a formal Nisqually Community Forest entity, the effort has grown faster than a Douglas fir at Mount Rainier!

Photo Credit: Jed Moore

Acreage:

The Nisqually Community Forest land holdings started with a modest 1,920 acres purchased for the goal of salmon recovery, with another 960 acres purchased recently, bringing the total acreage to 2,880. The Nisqually Indian Tribe also purchased an additional 1,201 acres that are contiguous to the original NCF. The current plan is to manage the lands together, bringing the total up to 4,881 acres managed for conservation!

Forest Products:

Over 1,200 MBF (1,000 board feet) of wood from 114 acres has been harvested by local contractors, contributing directly to the local economy. A large portion of the forest is of an age and tree density that will respond very well to being thinned, so the plan is to bring on an additional contractor summer 2022 to get at the backlog of acres in need of treatment. Thinning is an important step in promoting forest health and wildlife habitat development.

Carbon Sequestration:

The original 1,920 acres managed by the Nisqually Community Forest is being reviewed for a large carbon sequestration project. Once the project is finalized, carbon credits can then be sold, enabling the NCF to protect even more land.

Science:

Northwest Natural Resource Group, the Nisqually Community Forest's management partner, received a grant to create a long-term study on the effects of climate change on the forests. The study design calls for creating 1-acre gaps in the forest along with matching thinned stands. The openings will be replanted with nursery trees that come from parent trees that grew in areas that are hotter and dryer than here. The question being asked is "Will tree seedlings adapted to dryer climates survive being planted here?". If so, that means NCF can plant dryer, adapted trees to protect against predicted future climate conditions. The hope is that this will help create a forest that is more resilient to warmer, dryer summers.

Community Access:

The majority of recreation on the Nisqually Community Forest is the use of the Mount Tahoma Trails Association ski and snowshoe system in the winter. The Department of Natural Resources (DNR) is applying for a grant to rebuild the sno-park on DNR property just outside of the NCF boundary. The NCF plans to expand summer recreational activities, offering guided tours and hikes.

Photo Credit: Jaal Mann

Photo Credit: Jaal Mann

Photo Credit: Christopher Ellings

Timber, Fish, and Wildlife Program: 35 Years in the Making

In the 1980's, there were multiple concerns being raised about state-permitted timber practices and their resulting negative impacts to salmon habitat and thus on tribal treaty fishing rights. Witnessing the success of the Nisqually River Task Force and the subsequent development of the Nisqually Watershed Management Plan, Stu Bledsoe, the executive director of the Washington Forest Protection Association from 1978-1988, reached out to Billy Frank Jr. about the possibility of employing a similar approach to discuss tribal and timber issues around forest practices.

Though somewhat contentious, these facilitated discussions ultimately led to the development of rules related to forest practices negotiated and agreed upon by Washington State, Washington treaty tribes, the timber industry, and other environmental groups. In early 1987, the State's Department of Natural Resources (DNR) published the Timber, Fish, and Wildlife (TFW) Agreement was published, laying the groundwork for cooperative management of the state's forestlands. The groups had successfully avoid litigation and the TFW Program was born.

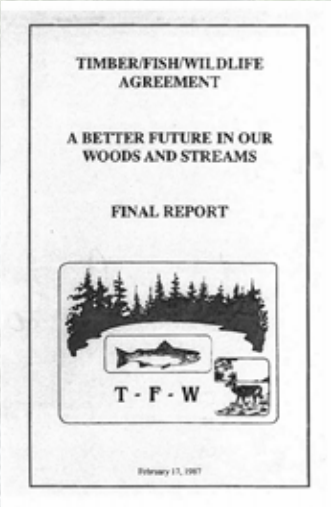
The plan included five broad goals:

- **Provide habitat diversity in forested areas and protect key habitat elements (wetlands, riparian corridors, old growth, etc.)**
- **Protect the long-term productivity of streams that support salmon productivity**
- **Protect water quality**
- **Recognize and protect cultural and archaeological sites**
- **Provide for a vibrant and productive forest products industry.**

One of the key concerns of the involved treaty tribes throughout the negotiations was the lack of funding for tribal staff to be able to monitor forest practices. How could tribes rely on the agreement if they could not participate in on-the-ground regulatory discussions? Thus, one of the results of the agreement was support for federal funding through the Bureau of Indian Affairs (BIA) for tribes to hire full-time TFW biologists.

For the first time, the Nisqually Indian Tribe had within its Department of Natural Resources, a dedicated staff person to monitor timber management practices in the Nisqually Watershed and investigate possible habitat impacts that these practices were having on salmon habitat, especially on tributary streams. The TFW position is now held by Nisqually tribal member, Kyle Kautz, who spends much of his time reviewing and assessing forest practice applications on behalf of the Tribe.

In the 35 years since the initial TFW agreement, there have many changes in forest ownership and management practices. Regulations and habitat standards have evolved as the result of ongoing research and monitoring. The program continues to be financially supported by the BIA, as well as receives funding from Washington DNR. Because of this enduring program, stakeholders are better able to recognize how important sustainable forest management practices are to the overall landscape and to critical ecological services that benefit the long-term sustainability of the Nisqually Watershed. How we implement these practices is key to a productive Nisqually Watershed for generations to come.

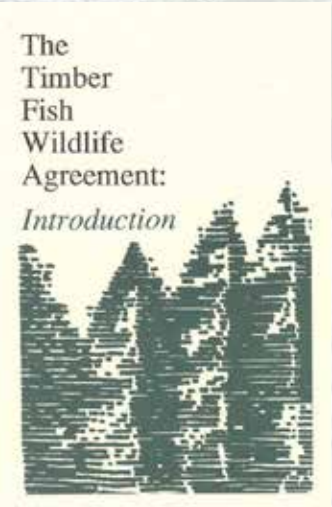

TIMBER/FISH/WILDLIFE AGREEMENT

A BETTER FUTURE IN OUR WOODS AND STREAMS

FINAL REPORT

T - F - W

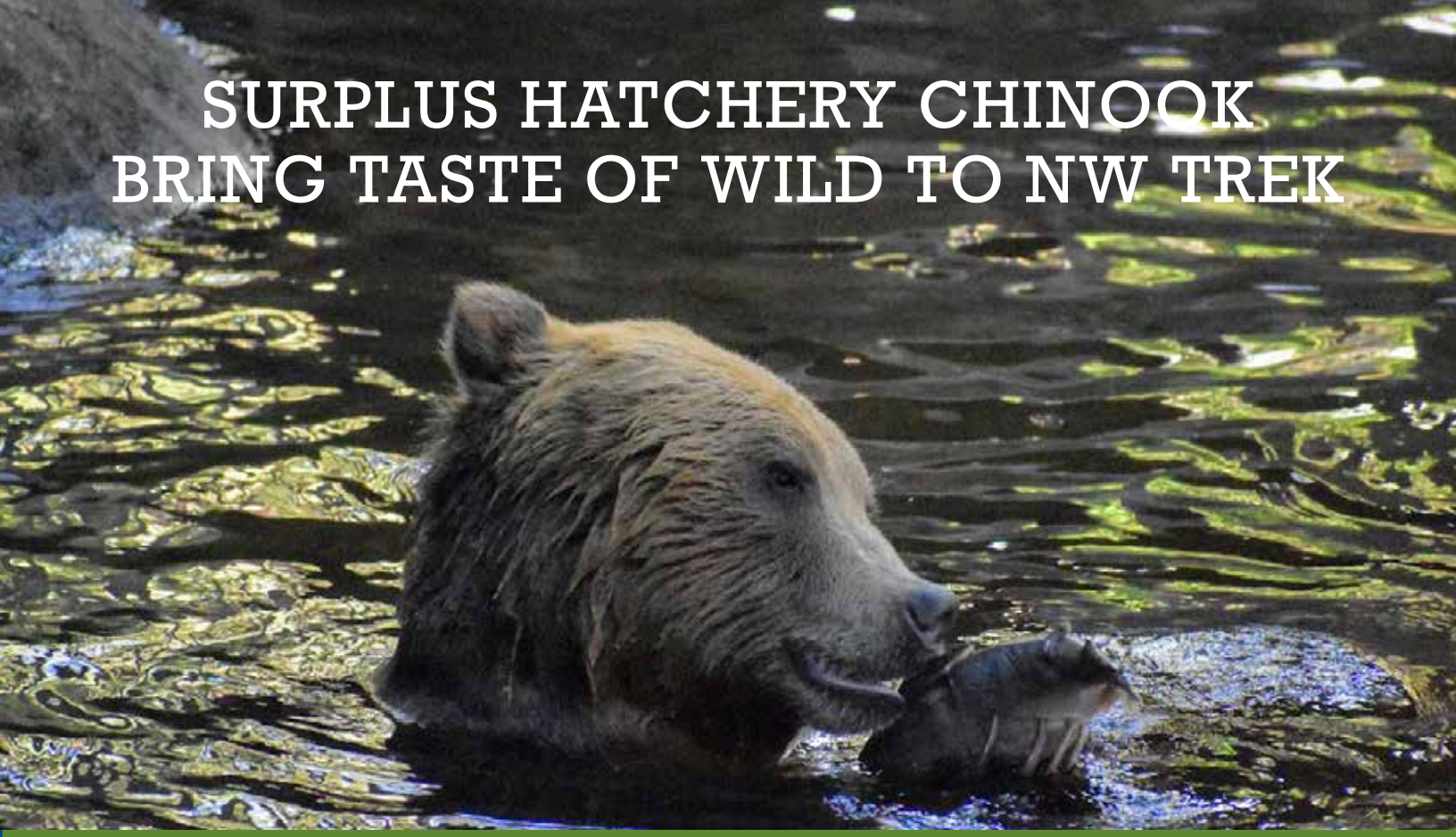
Want to learn more? You can access the original 1987 agreement here: https://www.dnr.wa.gov/publications/fp_tfw_agrmnt_1987.pdf



More information on the agreement can be found here: https://www.dnr.wa.gov/Publications/fp_tfw_agreement_intro.pdf

Kyle Kautz, the Tribe's Timber Fish and Wildlife biologist, performs a site visit.

SURPLUS HATCHERY CHINOOK BRING TASTE OF WILD TO NW TREK



Did you know that up to 137 species rely on salmon as a food source? It's for this reason that fall 2021, the Nisqually Indian Tribe began a partnership with Northwest Trek Wildlife Park to provide surplus hatchery Chinook salmon carcasses as a natural food source for the Park's critters. Grizzly bears and bald eagles are only two of the Park's inhabitants that get to enjoy fresh salmon. River otters, cougars, martens, and wolverines also dine on them as well!

"Feeding our bears whole salmon in their pool can create an experience similar to that of a wild grizzly bear fishing in a river. We observe our bears putting their heads under water to locate the fish and then using each of their feet and their mouths to bring the fish to the surface where they hold it in their paws and mouth and begin to eat. They spend more time in the water picking apart the fish and then afterwards grooming themselves to cleanup. All of these behaviors are important pieces of the fishing strategy that make grizzly bears so successful at catching salmon."

- Haley Withers, Animal Keeper, Northwest Trek Wildlife Park

Photo Credit: Ashley Von Essen

CLEANING UP THE RIVER

WITH NISQUALLY RIVER COUNCIL

Photo Credit: Sheila Wilson

Photo Credit: Thaten Olson

As the Nisqually River flows from Mount Rainier to the Puget Sound it offers beautiful views, fresh glacial waters, and ideal habitat for salmon runs throughout the year. However, in a world facing constant increase in urbanization, it takes the work of a community to keep our natural landscapes happy, healthy, and strong. It was with this thought that Greg Provenzano, member of th Washington kayak Club, had in mind when organizing the third major Nisqually River clean-up event which was held on Saturday, April 2nd. After a two-year hiatus caused by the coronavirus pandemic, volunteers made their way to the Nisqually watershed to boat sections of the river, from McKenna Park down to 6th Avenue. They collected trash, bringing it aboard their rafts, catarafts, kayaks, and canoes to be hauled out and away from the depths and banks of the water.

The colorful armada included boaters from the Washington Recreational River Runners, Washington Kayak Club, Paddle Trails Canoe Club, and individual rafters. As is typical for a Washington spring day, the boaters were greeted with a mix of clouds, sun, and the occasional rain shower along their roughly 17-mile journey. Nisqually River Foundation staff and volunteers hauled ashore the assortment of trash, which included an aluminum boat frame, several mattresses, and even a bike. These items were placed into drop bins provided by LeMay Pacific Disposal at Nisqually Park, also known as the Yelm Hydroelectric Project.

In total, 1.9 tons of trash was collected and removed by 82 volunteers signaling a successful clean-up and the power of an organized community. Greg hopes the clean-up will continue for many years to come as an annual community event centered around protecting our environment. While the realities of environmental pollution are hard to ignore, the smiling, sweaty faces of tired rafters that Saturday afternoon showed that even if the road is long, our community is inspired and ready to get to work. In addition to those already mentioned, a special thanks to the many individuals and organizations that came together to make this event a reality including the American Canoe Association, American Rivers National River Cleanup® Initiative, Nisqually Indian Tribe, Thurston County Public Works, Thurston County Litter Control Program, Centralia City Light, The Washington Department of Fish and Wildlife, Jackson Kayak Adventures, the Olympia REI Store, and Northwest River Supplies.

Photo Credit: Thaten Olson

Photo credit: Gabe Rush

NRC WELCOMES NEW PROGRAM COORDINATOR!

Welcome to the newest Nisqually River Foundation staff member Tristan Olson, who is currently serving as the Nisqually River Council Program Coordinator and Nisqually Reach Nature Center Resident Caretaker. Born and raised in Olympia, Tristan has always loved exploring the Pacific Northwest and is excited to be joining a community working to conserve and rehabilitate Washington's natural environment. He previously served two years as a Fulbright Scholar and Program Coordinator with the U.S. Department of State in the country of Malaysia and spent time last year working at an environmental nonprofit in San Diego. While in Malaysia, Tristan spent his weekends in the jungles of Borneo learning about one of the oldest, most biodiverse rainforests in the world and the threat posed to it through mass deforestation. His time in Borneo renewed his passion for environmental conservation and he is glad to be back in Washington working on protecting the natural landscape of his home state. Tristan received his Bachelor of Arts in English Creative Writing from Western Washington University while also studying Business Administration and Film. The opportunity to help coordinate the many different programs, meetings, and educational opportunities that make up this work is something he does not take for granted. He is looking forward to learning more, sharing knowledge, and protecting this environment alongside you all.

TREE PLANTING MOVES FORWARD DESPITE PANDEMIC

Photo Credit: Sheila Wilson

With the beginning of the 2020 virtual school year, it was clear that fall's tree planting season would need to be approached in a new and creative way. Students that were normally relied upon to help restore the banks of Nisqually River were learning from home and unable to take part in the Nisqually River Education Project's (NREP) annual habitat restoration field trips. Luckily, WA State had just transitioned into a new phase of re-opening, which allowed for socially-distanced, outdoor activities. So, NREP staff decided to try out a new technique to get volunteers in the field: extensive community outreach--and it really paid off!

As excited as staff was to bring in some fresh faces to help implement these important plantings, the community was just as eager to leave their homes for something fun and productive to do! While maintaining their distance and staying masked up, staff welcomed more than 240 people out to the Nisqually Land Trust's Powell Creek property to unload, place, plant, mulch, and protect (with tubes and stakes) nearly 2,500 native trees and shrubs.

Photo Credit: Sheila Wilson

In fall 2021, due the ongoing pandemic and a severe bus driver shortage, NREP was only able to bring out five elementary school groups and one group of college students. These trips combined brought 250 students and adults out to the Nisqually Land Trust's Lackamas Flats and Powell Creek Floodplain properties, contributing over 504 volunteer hours. And the fun didn't stop there! To complete the plantings, staff reached back out to the community, which brought an additional 223 volunteers out to help. Together, volunteers were able to put 4,080 native trees and shrubs into the ground!

If the pandemic has taught us anything, it's how to persevere to accomplish these very important tasks. As the big leaf maple, native roses, cedar, and spruce mature, they will provide shade, large wood, and habitat for insects and wildlife for decades to come, continuing to make our watershed healthier for our threatened salmon species and the people who call this special place home!

A big thanks to our partners, Nisqually Land Trust, Nisqually Indian Tribe, Washington Department of Fish and Wildlife, and WSC AmeriCorps, for making this project possible!

NREP Swims Strong During COVID

What do environmental education programs do when schools are closed and students can't come into the field with us? We bring the field to them! The Nisqually River Education Project (NREP) has been hard at work during the last two pandemic school years, even without our usual field trips. Despite the challenges, we were able to reach over 1,200 students in the 2020-2021 school year, with many participating in multiple programs for a total of 2,200+ student contacts. 2021-2022 is already going strong with almost 1,000 students reached so far at only halfway through the school year!

One of our most ambitious projects was creating a suitable digital replacement for our annual water quality monitoring field trips. In a typical year, students visit a local stream in the watershed and conduct a suite of chemical and physical tests, such as measuring the amount of dissolved oxygen or nitrates in the water. These trips were impossible to conduct in the fall of 2020, with all students fully remote, but we still wanted to provide students a fun, hands-on experience. Our four main goals were to:

1) MIMIC THE COLLECTION OF REAL DATA AS CLOSELY AS POSSIBLE.
2) INSPIRE A SENSE OF CONNECTION TO A REAL, NEARBY PLACE.
3) MAKE IT ACCESSIBLE TO ALL STUDENTS, REGARDLESS OF THE ON-LINE PLATFORM THEIR SCHOOL WAS USING.
4) MAKE IT FUN!

A screen shot of NREP's Water Quality Monitoring StoryMap.

Each goal presented its own unique challenges, but ultimately, we created something that preserved the spirit and fun of water quality monitoring in a digital format: an online portal, supplemented by an interactive notebook and a take-home science kit!

The portal uses ArcGIS StoryMap, an online mapping program, that students can access anytime, on any device, that connects them to real data collected by NREP and their volunteers. The program also links to background information and videos, as well as interactive games for each of the eight tests regularly used to measure water quality in the watershed. Activities range from using maps to locate their site, exploring 360° images of each site, and even playing Salmon Survivor, a short game in which you guide a salmon through its life based on the water quality it encounters. Many of these games and activities were created by NREP staff, while others (like a model watershed and a pH testing simulation) were drawn from other education programs nationwide. The result is an all-encompassing dive into the world of water through the lens of our incredible Nisqually watershed.

TAKE-HOME STEM KITS PROVIDED STUDENTS WITH THE MATERIALS NEEDED TO TEST TWO WATER QUALITY PARAMETERS IN THEIR OWN HOME (PH AND NITRATES) USING TEST STRIPS. THESE KITS PROVIDED SOME MUCH NEEDED TIME AWAY FROM THE SCREEN!

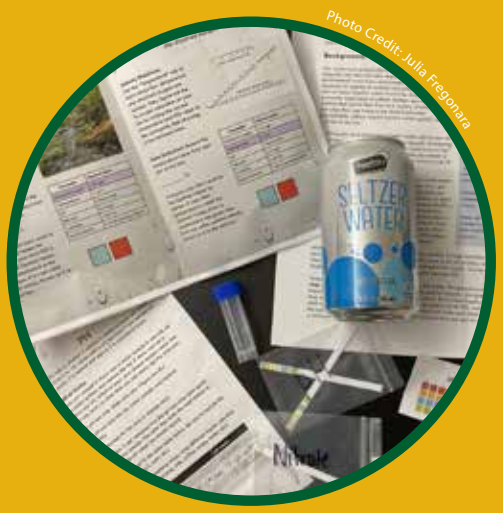


Photo Credit: Julia Fregonara

Want to learn more?
Visit our website at nrep.nisquallyriver.org

WATER QUALITY WASN'T THE ONLY PROJECT WE WORKED ON! WE ALSO HAD A SUITE OF VIRTUAL AND AT-HOME LESSONS, INCLUDING:


Photo Credit: Emily McCartan

SALMON DISSECTIONS:

NREP staff Zoomed into 19 classrooms for their own live salmon dissection. Students watched, recorded details in an interactive notebook, and asked plenty of questions as our staff outlined the structure and function of a salmon's body parts.

STUDENTS REACHED:
2020-2021: 462
2021-2022: 438

STREAM BUG LESSONS:

For these virtual lessons, students observed live benthic macroinvertebrates over Zoom using a microscope camera, identifying what they found using an interactive online key. Once they learn what type of insects were in their sample, they used that info to determine the health of the water using an interactive Index of Biological Integrity. Classrooms were also provided with benthic macroinvertebrates preserved in resin, so students could see the creatures up close and handle them safely and easily.


Photo Credit: Julia Fregonara

STUDENTS REACHED: 122


Photo Credit: Maya Nabipoor

OYSTER LESSONS:

NREP joined 14 classrooms over Zoom to talk about the biology and importance of oysters, do an oyster dissection, and introduce the concept of ocean acidification. These lessons included a take-home science kit that demonstrated the effect of ocean acidification on the shells of aquatic animals.

STUDENTS REACHED: 502

ENVIROSCAPE TAKE-HOME KITS:


Photo Credit: Maya Nabipoor

In order to learn more about stormwater runoff, students were able to watch a video where a large 3-D model showed the many sources of non-point pollution, such as pet waste, fertilizer on lawns, litter, etc. Students were then provided with kits that allowed them to create their own model watershed, observing the effects of polluted runoff on the watershed firsthand.

STUDENTS REACHED:
2020-2021: 164
2021-2022: 196

EXPLORING THE NISQUALLY WATERSHED NEARPOD AND VIDEOS:

This series of videos and activities, hosted on the platform NearPod, aims to inspire awe and promote curiosity amongst students about the incredible natural landscapes in their "backyard" with fun videos and games. NREP partnered with staff from the Billy Frank Jr. Nisqually National Wildlife Refuge and the Nisqually Reach Nature Center to develop this series.

STUDENTS REACHED: 1421

Nisqually Indian Tribe

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